

EXHIBIT 1

REDACTED

1 IN THE UNITED STATES DISTRICT COURT.
2 FOR THE EASTERN DISTRICT OF VIRGINIA
3 ALEXANDRIA DIVISION

- - -

4 UNITED STATES, et al., :
5 : NO.
6 Plaintiffs, : 1:23-cv-00108
7 : -LMB-JFA
8 v. :
9 :
10 GOOGLE LLC, :
11 :
12 Defendants. :
13

14 - HIGHLY CONFIDENTIAL -
15

16 - - -
17

18 August 27, 2025
19

20 - - -
21

22 Videotaped deposition of
GORANKA BJEDOV, Ph.D., taken pursuant to
notice, was held at the Department of
Justice, 450 9th Street, NW, Washington,
D.C., beginning at 9:05 a.m., on the
above date, before Michelle L. Ridgway, a
Registered Professional Reporter,
Certified Shorthand Reporter, Certified
Realtime Reporter, Certified Court
Reporter, and Notary Public.

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<p>1 All counsel will be noted</p> <p>2 on the stenographic record.</p> <p>3 The court reporter is</p> <p>4 Michelle Ridgway, also with</p> <p>5 Lexitas.</p> <p>6 And would you please swear</p> <p>7 in the witness.</p> <p>8 (Witness sworn.)</p> <p>9 - - -</p> <p>10 ... GORANKA BJEDOV, Ph.D.,</p> <p>11 having been first duly sworn,</p> <p>12 was examined and testified as</p> <p>13 follows:</p> <p>14 - - -</p> <p>15 EXAMINATION</p> <p>16 - - -</p> <p>17 BY MS. RHEE:</p> <p>18 Q. Good morning.</p> <p>19 A. Good morning.</p> <p>20 Q. I want to start off by</p> <p>21 asking whether or not you've ever been</p> <p>22 deposed before.</p>	<p>1 Q. Okay. So I think I</p> <p>2 understand your undergraduate degree is</p> <p>3 from Purdue University; is that right?</p> <p>4 A. No, that is not correct.</p> <p>5 My undergraduate degree is</p> <p>6 from University of Zagreb.</p> <p>7 Q. Okay.</p> <p>8 A. Z-A-G-R-E-B. Currently,</p> <p>9 the capital of Croatia. But it was</p> <p>10 obtained during the time of Yugoslavia.</p> <p>11 Q. Okay. And that was a</p> <p>12 Bachelor of Science?</p> <p>13 A. By American standard, it</p> <p>14 would be actually considered Bachelor's</p> <p>15 of Engineering.</p> <p>16 Q. Okay.</p> <p>17 A. But when it was translated,</p> <p>18 I didn't know, so it was translated as</p> <p>19 Bachelor's of Science. It was a</p> <p>20 five-year degree, basically.</p> <p>21 Q. In engineering?</p> <p>22 A. In engineering and with</p>
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<p>1 A. Never.</p> <p>2 Q. Okay.</p> <p>3 A. Sorry.</p> <p>4 Q. Lucky you.</p> <p>5 A. Yeah. Depends on how you</p> <p>6 look at it, but...</p> <p>7 Q. Okay. Given that, just</p> <p>8 want to go over some basic ground rules.</p> <p>9 I'm sure they've already been covered,</p> <p>10 but just on the record --</p> <p>11 A. Of course.</p> <p>12 Q. -- I will be asking you</p> <p>13 questions.</p> <p>14 A. Mm-hmm.</p> <p>15 Q. I need you to wait for me</p> <p>16 to finish asking the question, and then</p> <p>17 I will wait for you to answer, then back</p> <p>18 and forth. Okay?</p> <p>19 A. Makes sense. Yes.</p> <p>20 Q. Okay. Let me begin by just</p> <p>21 asking about your background. Okay?</p> <p>22 A. All right.</p>	<p>1 thesis. Yes.</p> <p>2 Q. Okay. And it was civil</p> <p>3 engineering; is that right?</p> <p>4 A. That is correct. It was</p> <p>5 civil engineering, yes.</p> <p>6 Q. For those of us who do not</p> <p>7 have an engineering background --</p> <p>8 A. Mm-hmm.</p> <p>9 Q. -- how would you describe</p> <p>10 what civil engineering is?</p> <p>11 A. So civil engineering is an</p> <p>12 oldest area of engineering, and it</p> <p>13 concerns itself with things like -- you</p> <p>14 have several different subfields, so I'm</p> <p>15 going to go through those.</p> <p>16 For example, you have</p> <p>17 probably the oldest one is the -- what</p> <p>18 we call the static subfield, and that</p> <p>19 one concerns itself with building</p> <p>20 structures, like buildings. To a lesser</p> <p>21 extent, bridges. But you're talking</p> <p>22 about large buildings.</p>

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<p>1 You have fluid mechanics,</p> <p>2 which happens to be my subfield of</p> <p>3 specialization. And that one really</p> <p>4 concerns itself with everything related</p> <p>5 to not just, you know, water and sun,</p> <p>6 but also things like air, you know,</p> <p>7 basically fluid motion, fluid movement,</p> <p>8 and is highly computational field.</p> <p>9 Then you have the third</p> <p>10 field that is -- depending on where you</p> <p>11 -- how you call it, but let's -- let's</p> <p>12 call it traffic engineering. These are</p> <p>13 the people that focus on roads,</p> <p>14 airports.</p> <p>15 In my system, in my world,</p> <p>16 traffic engineering did not involve</p> <p>17 things like, you know, traffic lights</p> <p>18 and directing the traffic but just</p> <p>19 really building things that are related</p> <p>20 to that.</p> <p>21 Then you have, for example,</p> <p>22 geotechnical engineering, which is also</p>	<p>1 Q. Okay. That's super</p> <p>2 helpful.</p> <p>3 And after you received your</p> <p>4 undergraduate degree in Croatia, it</p> <p>5 looks like you came to the United</p> <p>6 States; is that right?</p> <p>7 A. That is correct. I came to</p> <p>8 the United States.</p> <p>9 Q. Okay. And you got a</p> <p>10 Master's of Science in civil engineering</p> <p>11 from Clarkson University?</p> <p>12 A. That is correct.</p> <p>13 Q. Okay. And, again, was your</p> <p>14 subspecialty at that time fluid</p> <p>15 mechanics --</p> <p>16 A. Computational fluid</p> <p>17 mechanics, yes. Correct.</p> <p>18 Q. Okay. Okay. And then you</p> <p>19 stayed at Clarkson, it looks like, and</p> <p>20 you got a Ph.D. in engineering science;</p> <p>21 is that right?</p> <p>22 A. That is correct. Yes.</p>
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<p>1 highly computational, and that one is</p> <p>2 involved with all aspects of all of our</p> <p>3 structures, everything that we built</p> <p>4 stands on the ground.</p> <p>5 And the ground is a fairly</p> <p>6 complex mix of many particulate and</p> <p>7 nonparticulate soils. And so</p> <p>8 geotechnical engineering, their job is</p> <p>9 to tell you what you're really standing</p> <p>10 on, what can you expect of your</p> <p>11 substrate to give you so that you can</p> <p>12 then build the appropriate foundation</p> <p>13 and things like that.</p> <p>14 They also have a</p> <p>15 subspecialty, especially in California,</p> <p>16 earthquake engineering. So earthquake</p> <p>17 engineering would be a subfield of</p> <p>18 geotechnical engineering, and so those</p> <p>19 two fields obviously also highly</p> <p>20 computational.</p> <p>21 I think that pretty much</p> <p>22 summarizes the whole field, yes.</p>	<p>1 Q. Okay. And, again, was the</p> <p>2 specialty of fluid engineering?</p> <p>3 A. It was computational fluid</p> <p>4 mechanics. Yes.</p> <p>5 Q. Okay. And then after that</p> <p>6 it looks like you went to Purdue and got</p> <p>7 a Master's of Science; is that right?</p> <p>8 A. That is also correct. Yes.</p> <p>9 Q. Okay. And at that point,</p> <p>10 that's when you studied computer</p> <p>11 science?</p> <p>12 A. No. That -- that is</p> <p>13 incorrect.</p> <p>14 Q. Okay.</p> <p>15 A. You started with my</p> <p>16 undergraduate degree.</p> <p>17 Q. Yeah.</p> <p>18 A. Prior to my undergraduate</p> <p>19 degree, my undergraduate -- sorry -- my</p> <p>20 high school education was in computer</p> <p>21 science, and in particular, in</p> <p>22 informatics.</p>

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<p>1 And so I started</p> <p>2 programming when I was 13. I went to</p> <p>3 the high school for informatics. By the</p> <p>4 time I was 18, I was a little bit burnt</p> <p>5 out of coding, and so I decided to study</p> <p>6 a different field of engineering.</p> <p>7 And -- but throughout all</p> <p>8 of my studies, you really can't get a</p> <p>9 master's these days, or even a Ph.D.,</p> <p>10 without coding. And so I'm continuing</p> <p>11 to code and program.</p> <p>12 But during this time, also,</p> <p>13 the whole space develops tremendously.</p> <p>14 You start getting new programming</p> <p>15 languages and so on.</p> <p>16 And so by the time that I</p> <p>17 get a job at Purdue as a faculty</p> <p>18 teaching program to engineering</p> <p>19 students, I have decided to basically</p> <p>20 take a formal look at the field that</p> <p>21 I've been in for a long time and, you</p> <p>22 know, bring my knowledge to the level</p>	<p>1 degrees, other than the ones we covered?</p> <p>2 A. No, I do not have any</p> <p>3 degrees, additional.</p> <p>4 Q. Okay. Okay. And then your</p> <p>5 teaching experience, I take it, was when</p> <p>6 you were at Purdue; is that right?</p> <p>7 A. I have teaching experience</p> <p>8 at Purdue, but I've actually been</p> <p>9 instructor in the last two years of my</p> <p>10 Ph.D. at Clarkson.</p> <p>11 So as an instructor you</p> <p>12 also teach classes, and so I -- I've</p> <p>13 done that at Clarkson as well. So I</p> <p>14 have two years of teaching experience</p> <p>15 there and then seven years of teaching</p> <p>16 experience at Purdue.</p> <p>17 Q. Okay. So let me just put</p> <p>18 some dates to that.</p> <p>19 A. Sure.</p> <p>20 Q. Your teaching experience at</p> <p>21 Clarkson was in the last two years of</p> <p>22 your Ph.D.?</p>
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<p>1 that I felt it should be. And so that's</p> <p>2 when I get my master's in computer</p> <p>3 science.</p> <p>4 You will note that that</p> <p>5 master's was not thesis master's. I was</p> <p>6 mostly interested in coursework.</p> <p>7 Q. Okay. That's very helpful.</p> <p>8 And that is the sum total</p> <p>9 of your educational background; is that</p> <p>10 right?</p> <p>11 MR. TESLICKO: Object to</p> <p>12 form.</p> <p>13 THE WITNESS: So, no, not</p> <p>14 really.</p> <p>15 When you are faculty, you</p> <p>16 receive a lot of additional</p> <p>17 training. I'm not sure how much</p> <p>18 detail you want to go into.</p> <p>19 BY MS. RHEE:</p> <p>20 Q. Yeah. Let me -- let me</p> <p>21 rephrase the question, then.</p> <p>22 Do you have any other</p>	<p>1 A. That is correct.</p> <p>2 Q. Okay. So that's 1990 to</p> <p>3 1992?</p> <p>4 A. No. It is 1989 to 1991.</p> <p>5 Q. Okay. Thank you.</p> <p>6 And then your seven years</p> <p>7 of experience at Purdue, what are those</p> <p>8 years?</p> <p>9 A. Those are 1991 to 1998.</p> <p>10 Q. Okay. And what was your</p> <p>11 title when you were teaching at Purdue?</p> <p>12 A. I was -- at Purdue I was --</p> <p>13 for most of the time, I was assistant</p> <p>14 professor. But for the last year, I was</p> <p>15 associate professor. I don't remember</p> <p>16 the exact time on when I was promoted to</p> <p>17 associate, when I got tenure. But I --</p> <p>18 probably '97 -- '97, most likely.</p> <p>19 Q. Okay. And this was in the</p> <p>20 School of Civil Engineering?</p> <p>21 A. No. This was in the</p> <p>22 department -- well, actually, yes, it</p>

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<p>1 guess the middle of 2010 through</p> <p>2 February of 2019, you were at Facebook?</p> <p>3 A. That is correct as well.</p> <p>4 Q. Okay. And your title at</p> <p>5 Facebook was a performance and capacity</p> <p>6 engineer?</p> <p>7 A. That is correct as well.</p> <p>8 Yes.</p> <p>9 Q. Okay. And since February</p> <p>10 of 2019 --</p> <p>11 A. Mm-hmm.</p> <p>12 Q. -- where have you been</p> <p>13 working?</p> <p>14 A. I haven't.</p> <p>15 Q. Lucky you.</p> <p>16 A. You know, I would like to</p> <p>17 invite all of you to join me.</p> <p>18 Q. That sounds delightful.</p> <p>19 A. So to answer your question,</p> <p>20 since February '19 I have been mostly</p> <p>21 hiking around the world. So I've hiked</p> <p>22 two different caminos. I've just</p>	<p>1 probably find this out anyways. I</p> <p>2 called for the people who did it to be</p> <p>3 fired. And the people involved were HR</p> <p>4 and their legal representative, and, you</p> <p>5 know, calling for your legal</p> <p>6 representatives to be fired usually does</p> <p>7 not end up very well for you, which I'm</p> <p>8 perfectly fine with.</p> <p>9 Q. Okay. Got it.</p> <p>10 So were you let go from</p> <p>11 Facebook, based on the post that you</p> <p>12 made?</p> <p>13 A. I wish I could answer that</p> <p>14 question definitively. I believe I was.</p> <p>15 Facebook has always maintained that I</p> <p>16 resigned.</p> <p>17 Not sure what to tell you,</p> <p>18 but we have agreed to amicably part</p> <p>19 ways. I hold no animosity, and there</p> <p>20 was no need for me to kind of drill that</p> <p>21 into it.</p> <p>22 Q. Does that mean that you</p>
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<p>1 finished Tour du Mont Blanc. I've done</p> <p>2 the Inca Trail. I happen to spend a lot</p> <p>3 of my time hiking.</p> <p>4 Q. What made you decide to</p> <p>5 leave Facebook in February of 2019?</p> <p>6 A. So it was a very complex</p> <p>7 situation, internally. I wrote some</p> <p>8 things on internal boards that I</p> <p>9 probably shouldn't have, and...</p> <p>10 Q. Well, now I'm intrigued.</p> <p>11 Like what?</p> <p>12 A. I'm not sure how much of</p> <p>13 this -- I don't think any of this is</p> <p>14 public information, and so I want to</p> <p>15 make sure that what I say here does not</p> <p>16 reflect poorly on my -- on my previous</p> <p>17 employer, because I have nothing but</p> <p>18 gratitude towards Facebook. But I felt</p> <p>19 that they handled a particular situation</p> <p>20 involving a particular young woman</p> <p>21 incorrectly.</p> <p>22 And -- well, I -- you'll</p>	<p>1 left Facebook pursuant to a settlement</p> <p>2 agreement?</p> <p>3 A. I am not sure what that</p> <p>4 question means. Could you explain?</p> <p>5 Q. When you left Facebook --</p> <p>6 A. Mm-hmm.</p> <p>7 Q. -- was it pursuant to a</p> <p>8 legal agreement about the terms of your</p> <p>9 departure?</p> <p>10 A. No.</p> <p>11 Q. Okay. Well, when you say</p> <p>12 that Facebook says you resigned, do you</p> <p>13 believe you resigned?</p> <p>14 A. I don't believe I resigned.</p> <p>15 Q. Okay. So what do you</p> <p>16 believe happened?</p> <p>17 A. I believe that Facebook did</p> <p>18 not want me to remain employed for them,</p> <p>19 and so I didn't.</p> <p>20 Q. Do you believe you were</p> <p>21 pushed out?</p> <p>22 A. Not really. You know, I</p>

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<p>1 believe it was just one of those</p> <p>2 situations where -- I was a very</p> <p>3 high-level employee at Facebook. And as</p> <p>4 a high-level employee, you're really</p> <p>5 expected to understand some basic rules</p> <p>6 of behavior and observe them.</p> <p>7 One of them is not to speak</p> <p>8 openly and publicly against your company</p> <p>9 and the decisions made on the higher</p> <p>10 level. I broke those rules.</p> <p>11 I don't begrudge them.</p> <p>12 Their choice to say we cannot continue</p> <p>13 compensating you at this level if you're</p> <p>14 not going to be playing by the rules.</p> <p>15 That's reasonable.</p> <p>16 At the same time, I can't</p> <p>17 change who I am as a human being.</p> <p>18 My opinion is that the</p> <p>19 world that I have spent most of my</p> <p>20 career in is a really hard world for</p> <p>21 young women to start their career in,</p> <p>22 and if I'm not going to speak up for</p>	<p>1 engineering scale, Facebook has only ten</p> <p>2 levels. So the only higher level would</p> <p>3 have been fellow. And so I think there</p> <p>4 was maybe five people in the company at</p> <p>5 the time that were Level 9 and 10. So I</p> <p>6 would consider that a high level.</p> <p>7 And also, as I said, there</p> <p>8 was only one level above the level I was</p> <p>9 at.</p> <p>10 Q. Okay. I just want to</p> <p>11 understand.</p> <p>12 You think there were only</p> <p>13 five people at Facebook who were senior</p> <p>14 to you at the time that you left?</p> <p>15 A. No. No. I believe that</p> <p>16 there were only five people total on</p> <p>17 Levels 10 and 9. So I actually don't</p> <p>18 know if there was anybody who was</p> <p>19 Level 10, but there is one person that I</p> <p>20 suspect was Level 10.</p> <p>21 These kinds of things were</p> <p>22 not public. So "I don't know" is the</p>
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<p>1 them, as a person who is financially</p> <p>2 secure, has credibility, and so on, who</p> <p>3 will?</p> <p>4 So I considered that part</p> <p>5 of my personal loyalty more important</p> <p>6 than my loyalty to the company.</p> <p>7 I also completely</p> <p>8 understand and support the company</p> <p>9 saying, no, your loyalty to us. At this</p> <p>10 compensation level, your loyalty should</p> <p>11 be first to us.</p> <p>12 We just disagreed that and</p> <p>13 decided to part ways.</p> <p>14 Q. Okay. That's super</p> <p>15 helpful.</p> <p>16 When you say that you were</p> <p>17 a high-level Facebook employee --</p> <p>18 A. Mm-hmm.</p> <p>19 Q. -- I think I have that</p> <p>20 right -- what do you mean by high level?</p> <p>21 A. I -- at the time of my</p> <p>22 departure, I was Level 9. In the</p>	<p>1 answer.</p> <p>2 Q. So I just want to make sure</p> <p>3 I understand.</p> <p>4 You think that there were</p> <p>5 only five people total at Facebook in</p> <p>6 2019 when you left who were either at</p> <p>7 Level 9 or 10?</p> <p>8 A. Inside engineering. Very</p> <p>9 good question.</p> <p>10 Q. Okay.</p> <p>11 A. So you have two different</p> <p>12 tracks. You have an engineering IC</p> <p>13 track, which is the part that I am of,</p> <p>14 and inside that track, yes, I believe</p> <p>15 there was maybe five people.</p> <p>16 Inside management, they may</p> <p>17 have had 2,000, for all I care. I have</p> <p>18 no idea how many managers were that</p> <p>19 level.</p> <p>20 Q. Okay. That's helpful.</p> <p>21 So you were not a manager</p> <p>22 at Facebook?</p>

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<p>1 A. No, I was not a manager at</p> <p>2 Facebook.</p> <p>3 Q. All right. You were an</p> <p>4 individual contributor?</p> <p>5 A. That is correct. Yes.</p> <p>6 Q. Okay. And so you are only</p> <p>7 talking about seniority levels for</p> <p>8 individual contributors?</p> <p>9 A. Very correct. For</p> <p>10 engineers.</p> <p>11 Q. Okay. Well, but there are</p> <p>12 lots of engineers who are managers as</p> <p>13 well, correct?</p> <p>14 A. There are a lot of</p> <p>15 engineers who make the transition to the</p> <p>16 management track, yes.</p> <p>17 Q. Okay. Okay. So your</p> <p>18 testimony about being a Level 9 out of a</p> <p>19 10-level scale --</p> <p>20 A. Mm-hmm.</p> <p>21 Q. -- for engineers are about</p> <p>22 individually contributing engineers?</p>	<p>1 substance of any communications</p> <p>2 with counsel.</p> <p>3 THE WITNESS: Yeah. So,</p> <p>4 basically, I was contacted by</p> <p>5 the plaintiffs, and we discussed</p> <p>6 things, and I decided to accept</p> <p>7 their request to help them put</p> <p>8 together my -- my report.</p> <p>9 BY MS. RHEE:</p> <p>10 Q. Okay. And when was that?</p> <p>11 A. First contact was about two</p> <p>12 years ago. Yes, two years ago. Summer</p> <p>13 2023. But then nothing really happened</p> <p>14 until -- I think we finished all the</p> <p>15 paperwork in, like, January of 2024.</p> <p>16 Don't hold me on the -- but, roughly,</p> <p>17 that timeframe.</p> <p>18 Q. Okay. Okay. At the time</p> <p>19 that Plaintiffs contacted you, you had</p> <p>20 not done any expert work before; is that</p> <p>21 right?</p> <p>22 A. That is correct. Yes.</p>
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<p>1 A. Yes.</p> <p>2 Q. This is very helpful. I</p> <p>3 appreciate the clarification.</p> <p>4 And since February of 2019,</p> <p>5 you have been -- is it fair to say</p> <p>6 retired?</p> <p>7 A. Yes.</p> <p>8 Q. Okay.</p> <p>9 A. I consider myself retired.</p> <p>10 Yes.</p> <p>11 Q. Okay. How did you come</p> <p>12 about being retained in this case?</p> <p>13 MR. TESLICKO: I just</p> <p>14 remind the witness not to</p> <p>15 disclose the substance of any</p> <p>16 communications with Plaintiffs'</p> <p>17 counsel.</p> <p>18 THE WITNESS: So I was</p> <p>19 contacted by the plaintiffs and</p> <p>20 asked if I felt that I could --</p> <p>21 MR. TESLICKO: Just remind</p> <p>22 you not to disclose the</p>	<p>1 Q. Okay. Do you know how</p> <p>2 Plaintiffs found you?</p> <p>3 MR. TESLICKO: I just</p> <p>4 remind the witness again not to</p> <p>5 disclose the substance of any</p> <p>6 communications with counsel.</p> <p>7 THE WITNESS: I actually</p> <p>8 don't, no.</p> <p>9 BY MS. RHEE:</p> <p>10 Q. So you got a call out of</p> <p>11 the blue, at least from your</p> <p>12 perspective?</p> <p>13 A. From -- from my</p> <p>14 perspective. And I can even describe</p> <p>15 the situation. I got an e-mail while I</p> <p>16 was on one of my trips, and I'm --</p> <p>17 Q. And you went to an internet</p> <p>18 cafe and got some Wi-Fi.</p> <p>19 A. -- as you can imagine that</p> <p>20 it impacted that particular day, and --</p> <p>21 Q. Where were you?</p> <p>22 A. I was in Croatia at the</p>

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<p>1 time. I was, actually, after my trip,</p> <p>2 with my mom. That's why I remember the</p> <p>3 timing.</p> <p>4 And -- and so I responded</p> <p>5 to that particular e-mail, and, you</p> <p>6 know, obviously this is your world. And</p> <p>7 for maybe for all of you, this would be</p> <p>8 like, well, you know, it's just DOJ.</p> <p>9 For me it's like, oh, my God, what did I</p> <p>10 do now.</p> <p>11 And -- and so we set up the</p> <p>12 time to talk on the phone, time</p> <p>13 differences being what they are.</p> <p>14 We ended up talking, and,</p> <p>15 obviously, that communication, my</p> <p>16 understanding is it's protected. And</p> <p>17 so --</p> <p>18 Q. I got it. Okay.</p> <p>19 A. Mm-hmm.</p> <p>20 Q. Have you been retained in</p> <p>21 any other case to provide expert work?</p> <p>22 A. No.</p>	<p>1 this is 2012, 2013. So I can tell you</p> <p>2 that Mr. Eric Cantor was the Speaker of</p> <p>3 the House at the time.</p> <p>4 Q. Okay.</p> <p>5 A. I -- whatever. He was</p> <p>6 Republican lead at the time.</p> <p>7 Q. Okay.</p> <p>8 A. So he was -- he was -- it</p> <p>9 was during his tenure.</p> <p>10 Q. Okay.</p> <p>11 A. And they were the</p> <p>12 Republican caucus. And I apologize,</p> <p>13 because all of these terms are very much</p> <p>14 outside of my normal vocabulary, so if I</p> <p>15 misuse some of them, I'm sorry.</p> <p>16 They were having a hearing</p> <p>17 on, you know, status of women in</p> <p>18 technology and -- and in those fields.</p> <p>19 And in particular, I received a request</p> <p>20 from Facebook's office in Washington</p> <p>21 that I be present. That was very</p> <p>22 unusual. And the explanation was that</p>
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<p>1 Q. Okay. So this is the one</p> <p>2 and only?</p> <p>3 A. This is my one and only,</p> <p>4 yes.</p> <p>5 Q. Okay. Based on that, I</p> <p>6 take it you've never put yourself up as</p> <p>7 a testifying expert before?</p> <p>8 A. So there was one situation</p> <p>9 where I was specifically requested by a</p> <p>10 congressperson from Indiana to be</p> <p>11 provided by Facebook to testify in</p> <p>12 Congress hearings.</p> <p>13 Not sure whether you</p> <p>14 consider that or not, but there -- there</p> <p>15 was that particular experience as well.</p> <p>16 Q. Okay. And did you actually</p> <p>17 testify before Congress?</p> <p>18 A. I was present at the</p> <p>19 hearings.</p> <p>20 Q. What does it mean to be</p> <p>21 "present at the hearings"?</p> <p>22 A. So they had hearings --</p>	<p>1 there was a particular congressperson</p> <p>2 from Indiana who wanted me -- who wanted</p> <p>3 Facebook to provide me as a witness.</p> <p>4 Again, in that kind of</p> <p>5 situation, you just do what your company</p> <p>6 wants you to do. And I was in</p> <p>7 Washington, D.C., present at the</p> <p>8 hearings.</p> <p>9 Q. So physically present?</p> <p>10 A. Physically present, yeah.</p> <p>11 I was in the room, sitting next to the</p> <p>12 congresswoman, and watched the whole</p> <p>13 thing sort of go around me.</p> <p>14 Q. Okay. So you watched the</p> <p>15 hearing.</p> <p>16 Did you talk at the</p> <p>17 hearing?</p> <p>18 A. No.</p> <p>19 Q. Okay.</p> <p>20 A. I was instructed by our</p> <p>21 team to not say anything unless I was</p> <p>22 specifically asked a question. Nobody</p>

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<p>1 list of candidates in this</p> <p>2 field. Like -- no.</p> <p>3 BY MS. RHEE:</p> <p>4 Q. Okay.</p> <p>5 A. This is completely outside</p> <p>6 of my area of expertise.</p> <p>7 Q. Okay. So also safe to say</p> <p>8 you've never written an expert report</p> <p>9 before?</p> <p>10 A. That is very correct. Yes.</p> <p>11 Q. Okay. How many people from</p> <p>12 Keystone Strategy were assigned to help</p> <p>13 you?</p> <p>14 A. I actually don't know the</p> <p>15 answer to that question.</p> <p>16 Q. How do you not know?</p> <p>17 A. I can only tell you,</p> <p>18 roughly, how many people I interacted</p> <p>19 with.</p> <p>20 Q. Okay.</p> <p>21 A. But were there people doing</p> <p>22 work that, you know, I am unaware of? I</p>	<p>1 A. I do know the answer to</p> <p>2 that question.</p> <p>3 Q. Okay.</p> <p>4 A. So I have -- so far I have</p> <p>5 charged about \$150,000 --</p> <p>6 Q. Okay.</p> <p>7 A. -- total.</p> <p>8 I have been paid out</p> <p>9 \$80,000. So \$80,000. That's 200 hours.</p> <p>10 Yeah. So a couple hundred hours. Like</p> <p>11 500 hours or so.</p> <p>12 Q. Okay. Yeah. Sorry. I</p> <p>13 can't do math, hence I took out my phone</p> <p>14 to pull out the calculator.</p> <p>15 A. No, no. That's fine.</p> <p>16 But I do remember -- as I</p> <p>17 said, I do remember the exact numbers</p> <p>18 for how much I have billed for and how</p> <p>19 much I have been -- received payment</p> <p>20 for, but I haven't billed for all of the</p> <p>21 hours yet.</p> <p>22 Q. Okay. So sitting here</p>
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<p>1 don't know. So I don't -- I honestly</p> <p>2 don't know the answer to your question.</p> <p>3 I personally interacted</p> <p>4 with -- let me think -- maybe ten</p> <p>5 people. Again, order of magnitude.</p> <p>6 Q. Okay.</p> <p>7 A. So ten.</p> <p>8 Q. Okay. How many hours have</p> <p>9 you personally spent in preparation of</p> <p>10 your reports in this case?</p> <p>11 A. That is a very complex</p> <p>12 question. I -- let me think.</p> <p>13 Approximately, couple of</p> <p>14 hundred hours, I would guess. Yeah, I</p> <p>15 would -- I would guess couple of hundred</p> <p>16 hours, maybe 300.</p> <p>17 Q. Okay. Well, you're</p> <p>18 charging by the hour, right?</p> <p>19 A. I am.</p> <p>20 Q. Okay. And sitting here</p> <p>21 today, you don't know how much you've</p> <p>22 charged so far?</p>	<p>1 today, your best approximation is about</p> <p>2 500 hours; is that what I'm hearing?</p> <p>3 MR. TESLICKO: Object to</p> <p>4 form.</p> <p>5 THE WITNESS: I would</p> <p>6 guess 500 hours, yes, on</p> <p>7 preparation of reports. Yes,</p> <p>8 that sounds reasonable.</p> <p>9 BY MS. RHEE:</p> <p>10 Q. Okay. Do you know how many</p> <p>11 hours the staff at Keystone have worked</p> <p>12 on your report?</p> <p>13 A. Not the slightest idea.</p> <p>14 Q. Okay. How did you go about</p> <p>15 selecting what you reviewed in</p> <p>16 connection with your report?</p> <p>17 A. So as I'm sure you're</p> <p>18 aware, there was a mountain of documents</p> <p>19 in this case.</p> <p>20 Q. You don't say.</p> <p>21 A. And so my strategy for --</p> <p>22 when you get the mountain, there is no</p>

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<p>1 way I can --</p> <p>2 Q. Well, did you get a</p> <p>3 mountain?</p> <p>4 A. Oh, yeah. I had access to</p> <p>5 everything that was produced in the</p> <p>6 case.</p> <p>7 Q. Okay.</p> <p>8 A. And so now I -- you know, I</p> <p>9 see all of these documents, and I see</p> <p>10 the timelines. And I'm going, like, all</p> <p>11 right.</p> <p>12 Q. When you say "timelines,"</p> <p>13 what do you mean? What are you</p> <p>14 referring to?</p> <p>15 A. Oh, I'm talking about when</p> <p>16 my report needs to be written and then</p> <p>17 when the rebuttal report needs to be</p> <p>18 written --</p> <p>19 Q. I see.</p> <p>20 A. -- and then the reply</p> <p>21 report.</p> <p>22 From my perspective, this</p>	<p>1 A. I think I've had access to</p> <p>2 some of the stuff before 2025.</p> <p>3 Q. Okay.</p> <p>4 A. But definitely not all of</p> <p>5 the stuff.</p> <p>6 Q. Okay.</p> <p>7 A. But there was just a lot of</p> <p>8 documents.</p> <p>9 Q. Okay. And can I ask --</p> <p>10 because what we have, as I'm sure you</p> <p>11 know --</p> <p>12 A. Mm-hmm.</p> <p>13 Q. -- because they are your</p> <p>14 reports, the Appendix A for each one of</p> <p>15 your reports --</p> <p>16 A. Mm-hmm.</p> <p>17 Q. -- lists the materials that</p> <p>18 you relied upon for that report, right?</p> <p>19 A. It lists a subset of</p> <p>20 materials that -- in particular,</p> <p>21 materials that I referred to and quoted</p> <p>22 in the report.</p>
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<p>1 is all moving fairly quickly. But,</p> <p>2 again, I'm giving you a judgment on</p> <p>3 something that I really have no basis</p> <p>4 for comparison. So you may disagree and</p> <p>5 you may reasonably say no, no, no, this</p> <p>6 is a very slow one.</p> <p>7 For me, personally, I felt</p> <p>8 that things were moving quickly.</p> <p>9 Q. Okay. So when did you</p> <p>10 first get access to, as you put it, the</p> <p>11 mountain of documents in connection with</p> <p>12 when you thought your first report was</p> <p>13 due?</p> <p>14 A. I really don't remember. I</p> <p>15 honestly don't remember. This was a</p> <p>16 long time ago. I would really hate to</p> <p>17 make a guess here. I don't remember.</p> <p>18 I'm sorry.</p> <p>19 Q. Okay. Well --</p> <p>20 A. A long time ago.</p> <p>21 Q. -- what do you mean by "a</p> <p>22 long time ago"? In 2025?</p>	<p>1 I've certainly reviewed a</p> <p>2 lot more things that I don't necessarily</p> <p>3 quote because I find them not relevant</p> <p>4 to the matter that I'm discussing.</p> <p>5 Q. Okay. So I want to make</p> <p>6 sure I understand.</p> <p>7 What you put in those</p> <p>8 appendices to your report --</p> <p>9 A. Mm-hmm.</p> <p>10 Q. -- is only what you cited?</p> <p>11 A. That is correct. Yes.</p> <p>12 Q. But that is not -- let me</p> <p>13 make sure I break this down.</p> <p>14 It is not everything that</p> <p>15 you reviewed?</p> <p>16 A. That is correct. Yes.</p> <p>17 Q. Okay. And I take it, it is</p> <p>18 not everything you relied upon --</p> <p>19 MR. TESLICKO: Object to</p> <p>20 form.</p> <p>21 BY MS. RHEE:</p> <p>22 Q. -- if you didn't actually</p>

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<p>1 cite it?</p> <p>2 MR. TESLICKO: Object to</p> <p>3 form.</p> <p>4 THE WITNESS: No. If I am</p> <p>5 using a document to form my</p> <p>6 opinion or if I'm using a</p> <p>7 document to -- let's put it this</p> <p>8 way -- to say, well -- and here</p> <p>9 is a document that confirms my</p> <p>10 opinion, then I'm going to cite</p> <p>11 it.</p> <p>12 BY MS. RHEE:</p> <p>13 Q. Okay.</p> <p>14 A. But if I'm just reading a</p> <p>15 document -- for example, I've read</p> <p>16 transcripts of depositions, of -- number</p> <p>17 of them. And I apologize. I'm really</p> <p>18 terrible with names.</p> <p>19 Q. Okay.</p> <p>20 A. But I've read the</p> <p>21 transcripts from several Google</p> <p>22 witnesses in the case. I've read them</p>	<p>1 Does that sound roughly</p> <p>2 right to you?</p> <p>3 A. Oh, I remember there was</p> <p>4 about 20, 21 in the first report, so the</p> <p>5 numbers, order of magnitude, certainly</p> <p>6 makes sense, yes.</p> <p>7 Q. Okay.</p> <p>8 A. And then there is a whole</p> <p>9 lot of other documents that I cite --</p> <p>10 Q. I totally understand, but I</p> <p>11 just want to focus on the</p> <p>12 Google-produced documents for now.</p> <p>13 A. All right.</p> <p>14 Q. Okay. You're right. You</p> <p>15 cite -- or you list 20-some-odd Google</p> <p>16 documents in your opening report.</p> <p>17 A. Mm-hmm.</p> <p>18 Q. And then in total it's</p> <p>19 about 30. Sound about right?</p> <p>20 A. Sounds fair. Yes.</p> <p>21 Q. Okay. And based on your</p> <p>22 answer just now, that is the universe of</p>
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<p>1 for several reasons. Because I wanted</p> <p>2 to see what this process looks like, but</p> <p>3 also I wanted to understand, you know,</p> <p>4 what are they saying, what are they</p> <p>5 claiming. Are they saying things that I</p> <p>6 will strongly disagree with and say,</p> <p>7 well, no, that's just wrong, and I can</p> <p>8 prove it is wrong.</p> <p>9 Or are they saying things</p> <p>10 that you can look at and go, like, well,</p> <p>11 I disagree with them, but, objectively,</p> <p>12 it's quibbling.</p> <p>13 And so I read a lot of</p> <p>14 those depositions. I don't cite them in</p> <p>15 my report. They were completely</p> <p>16 irrelevant to it.</p> <p>17 Q. Okay. I think I</p> <p>18 understand.</p> <p>19 You cite, I think, 30 -- I</p> <p>20 think the count is something around 32</p> <p>21 unique Google documents across your</p> <p>22 three reports.</p>	<p>1 Google-produced documents, out of the</p> <p>2 mountain of documents that you had</p> <p>3 access to, that you either cited in your</p> <p>4 reports or otherwise relied upon; is</p> <p>5 that right?</p> <p>6 MR. TESLICKO: Object to</p> <p>7 form.</p> <p>8 THE WITNESS: So there are</p> <p>9 other Google documents that I</p> <p>10 have read and thought, oh,</p> <p>11 they -- [REDACTED]</p> <p>12 [REDACTED]</p> <p>13 that I didn't cite because,</p> <p>14 honestly, the form that they</p> <p>15 were written in, I totally</p> <p>16 understand. They were</p> <p>17 engineers.</p> <p>18 But I didn't think that in</p> <p>19 the legal sense it would be very</p> <p>20 helpful to either you or the</p> <p>21 judge to see [REDACTED]</p> <p>22 [REDACTED]</p>

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1 which makes perfect sense in my
2 world, but I'm going to guess
3 that anybody else will go, like,
4 what in the world are these
5 people talking about.
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]
11 [REDACTED]
12 [REDACTED]
13 But how do you present to
14 anybody else outside of the
15 technology space what [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 [REDACTED].
20 BY MS. RHEE:
21 Q. So you're referring to a
22 document produced by Google that you

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1 read --
2 A. Mm-hmm.
3 Q. I think you need to just
4 say yes or no on the record.
5 A. Oh. Yes.
6 Q. -- that you believe is
7 [REDACTED]?
8 A. That is correct.
9 MR. TESLICKO: Object to
10 form.
11 Sorry.
12 THE WITNESS: Sorry.
13 BY MS. RHEE:
14 Q. But you did not cite it?
15 MR. TESLICKO: Object to
16 form.
17 THE WITNESS: Could you
18 repeat the question, please.
19 And sorry about that.
20 BY MS. RHEE:
21 Q. Yeah. I'm sure you've been
22 instructed. Mr. Teslicko is doing his

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1 job, but regardless of his objection,
2 unless he specifically instructs you not
3 to answer, you need to answer my
4 question.
5 A. And I hope, you know, that
6 so far I haven't --
7 Q. You've been great. I'm
8 really just talking to Mr. Teslicko.
9 MR. TESLICKO: If I could
10 just say, can you please wait
11 for counsel to finish her
12 question full, because that's
13 part of the problem. That would
14 be great.
15 THE WITNESS: I'm really
16 sorry for making this difficult
17 for you.
18 BY MS. RHEE:
19 Q. You're fine. So let's just
20 rewind.
21 You just talked about a
22 document produced by Google that you

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1 reviewed, correct?
2 A. That is correct.
3 Q. Okay. You did not put it
4 on any of your appendices, correct?
5 A. That is also correct, yes.
6 Q. Okay. But, nevertheless,
7 you believe that document [REDACTED]
8 [REDACTED]?
9 MR. TESLICKO: Object to
10 form.
11 THE WITNESS: I would say
12 that -- that my evaluation was
13 [REDACTED]
14 [REDACTED]
15 [REDACTED].
16 BY MS. RHEE:
17 Q. So it went into your
18 thinking about this case?
19 MR. TESLICKO: Object to
20 form.
21 THE WITNESS: Not really.
22 Outside of, man, if I were

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1 presenting this to a bunch of
2 engineers, [REDACTED]
3 [REDACTED]
4 [REDACTED]. But,
5 unfortunately, that's not my
6 audience, so, you know.
7
8 Outside of that, no, I --
9 you know, it's --
10 BY MS. RHEE:
11 Q. Okay. Let me try this
12 again.
13 A. Mm-hmm. Mm-hmm.
14 Q. This is one example of a
15 document that is on topic, related to
16 your opinion, but you did not put it on
17 any of the appendices. Yes?
18 MR. TESLICKO: Object to
19 form.
20 THE WITNESS: This is one
21 document that I believe -- and I
22 really believe most engineers

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1 would agree with me on this --
2 [REDACTED].
3 And this is one document
4 that I didn't include in the --
5 and I didn't cite and refer to
6 because I felt it was maybe --
7 let's call it too informal and
8 could be reasonably questioned
9 by anybody who hasn't worked and
10 lived in the world that I work
11 in and live in, as to how is
12 this even relevant.
13 BY MS. RHEE:
14 Q. Okay. And how many more
15 documents did you review that Google had
16 produced, that you had access to, that
17 was topically related to the subject
18 matter of your opinion but, for one
19 reason or another, you decided not to
20 put down in your appendices?
21 MR. TESLICKO: Object to
22 form.

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1 THE WITNESS: Oh. Oh,
2 wow. Really no idea.
3 BY MS. RHEE:
4 Q. Well, more than one?
5 A. More than one.
6 Q. Okay. More than ten?
7 A. You are asking me to
8 estimate, in legal proceedings,
9 something that I really -- if I had
10 known that I should keep track of, you
11 know.
12 Q. That's okay. I just want
13 your best guess.
14 MR. TESLICKO: Object to
15 form.
16 THE WITNESS: My best
17 guess would be somewhere between
18 10 and 20, maybe.
19 And you did add a
20 stipulation there that --
21 because some documents I would
22 run into would be talking about

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1 business stuff or -- so on, and
2 those -- those, I immediately
3 dismiss because they don't --
4 they have nothing to do with
5 work I'm doing and what I have
6 been asked to opine on.
7 Do you count the document
8 or not, and how many of those --
9 let's say somewhere between 10
10 and 20.
11 BY MS. RHEE:
12 Q. Okay. That's your best
13 guess, sitting here today?
14 A. That is my best guess, yes.
15 Q. Okay. Your opinion goes
16 through your timeline estimates for the
17 various DOJ steps or phases of remedy;
18 is that right?
19 MR. TESLICKO: Object to
20 form.
21 THE WITNESS: So my
22 opinion gives timelines for

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<p>1 different parts of Plaintiffs'</p> <p>2 proposed remedies.</p> <p>3 BY MS. RHEE:</p> <p>4 Q. Yes. Okay. So let's just</p> <p>5 quickly go through those. Right?</p> <p>6 A. Mm-hmm.</p> <p>7 Q. DOJ's proposed remedies for</p> <p>8 what they refer to as DFP --</p> <p>9 A. Mm-hmm.</p> <p>10 Q. -- goes in three phases,</p> <p>11 right?</p> <p>12 A. That is correct.</p> <p>13 Q. Okay. And the first phase,</p> <p>14 which is a form of integration, right?</p> <p>15 The first phase is a Prebid integration,</p> <p>16 right?</p> <p>17 MR. TESLICKO: Object to</p> <p>18 form.</p> <p>19 THE WITNESS: Excuse me?</p> <p>20 You say form of integration?</p> <p>21 Could you tell me what you mean</p> <p>22 by that.</p>	<p>1 APIs, they actually need to connect to</p> <p>2 something, right?</p> <p>3 MR. TESLICKO: Object to</p> <p>4 form.</p> <p>5 THE WITNESS: So in order</p> <p>6 for API to be useful, you</p> <p>7 typically are connecting to a</p> <p>8 system.</p> <p>9 BY MS. RHEE:</p> <p>10 Q. Mm-hmm.</p> <p>11 A. And it's the system that</p> <p>12 exposes its API.</p> <p>13 So you have exchanges, and</p> <p>14 inside those exchanges, there is a</p> <p>15 bidding process going on. Those</p> <p>16 exchanges have APIs.</p> <p>17 And what we're saying is,</p> <p>18 Google needs to provide APIs that would</p> <p>19 level the playing field for the</p> <p>20 bidding -- during the bidding process.</p> <p>21 Q. Mm-hmm. Okay.</p> <p>22 And what is the timeframe</p>
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<p>1 BY MS. RHEE:</p> <p>2 Q. Well, actually, maybe I</p> <p>3 should ask you.</p> <p>4 What is the first phase</p> <p>5 that you opine upon?</p> <p>6 A. So the first phase of DFP</p> <p>7 divestiture -- and you can see in my</p> <p>8 report -- is creation of the APIs.</p> <p>9 Those --</p> <p>10 Q. APIs to what?</p> <p>11 A. So you're looking at,</p> <p>12 basically, application program</p> <p>13 interfaces that would make Google</p> <p>14 participate on the same level as other</p> <p>15 exchanges in bidding process.</p> <p>16 Q. Okay. So APIs to what?</p> <p>17 A. So APIs to make Google</p> <p>18 participate on the same level to the</p> <p>19 bidding process.</p> <p>20 Q. Well, do you know how APIs</p> <p>21 effectuate that?</p> <p>22 At least as I understand</p>	<p>1 that you estimate in order for those</p> <p>2 APIs to be created and confirmed to work</p> <p>3 as intended?</p> <p>4 MR. TESLICKO: Object to</p> <p>5 form.</p> <p>6 THE WITNESS: So I specify</p> <p>7 that in my report.</p> <p>8 And I -- is it okay if I</p> <p>9 point out to where this is in my</p> <p>10 report?</p> <p>11 BY MS. RHEE:</p> <p>12 Q. We can get there.</p> <p>13 But I just want to know,</p> <p>14 since this is your opinion --</p> <p>15 A. Mm-hmm.</p> <p>16 Q. -- it's less about your</p> <p>17 report, but just your opinion.</p> <p>18 Do you know how long you</p> <p>19 estimated that step to take?</p> <p>20 MR. TESLICKO: Object to</p> <p>21 form.</p> <p>22 THE WITNESS: I can answer</p>

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<p>1 the question. I do want to give</p> <p>2 you a caveat that there are many</p> <p>3 different parts, moving parts,</p> <p>4 in this particular case, and so,</p> <p>5 to the best of my recollection,</p> <p>6 which could be off in this case,</p> <p>7 if I remember correctly, it was</p> <p>8 18 months.</p> <p>9 It could go as high as 24,</p> <p>10 but I think 18 months is a</p> <p>11 reasonable amount of time for</p> <p>12 creation of APIs.</p> <p>13 BY MS. RHEE:</p> <p>14 Q. Okay. And then you opine</p> <p>15 about the next step in DOJ's proposal to</p> <p>16 divest DFP, right?</p> <p>17 A. Mm-hmm. That is correct.</p> <p>18 Q. Okay. And what is your</p> <p>19 understanding of what that Phase 2 is?</p> <p>20 A. So as per Plaintiffs'</p> <p>21 proposed remedies, Phase 2 is</p> <p>22 open-sourcing of the final auction logic</p>	<p>1 understanding of what Phase 3 entails?</p> <p>2 A. So my understanding of</p> <p>3 Phase 3 is that it involves what I would</p> <p>4 call cutting out and moving DFP and</p> <p>5 making it available for purchase to one</p> <p>6 or more buyers. Obviously, the DFP</p> <p>7 product that remains after Phase 1 and</p> <p>8 Phase 2 have been completed.</p> <p>9 Q. Okay. And what is your</p> <p>10 opinion about how long that is going to</p> <p>11 take?</p> <p>12 A. So, again, I would like to</p> <p>13 refer you to my report.</p> <p>14 I estimate that DFP</p> <p>15 divestiture is going to take a little</p> <p>16 bit longer than the other two things,</p> <p>17 and there are specific reasons for it.</p> <p>18 And I think my estimate is</p> <p>19 that DFP by itself should be</p> <p>20 somewhere -- let's call it in 24 to</p> <p>21 30 months.</p> <p>22 Q. Okay. And then, finally,</p>
Page 79	Page 81
<p>1 and making it available in an</p> <p>2 open-source context.</p> <p>3 Q. Okay. And what is your</p> <p>4 opinion about how long that's going to</p> <p>5 take?</p> <p>6 A. Again, that has been</p> <p>7 defined in my -- in my report, so I'm</p> <p>8 not quite sure --</p> <p>9 Q. Well, it's your opinion,</p> <p>10 right?</p> <p>11 A. In my opinion, as defined</p> <p>12 in my report -- and I do want to say</p> <p>13 what is in the report should be taken as</p> <p>14 the accurate statement in this. You're,</p> <p>15 again, looking at a timeframe of</p> <p>16 18 months to 24 months.</p> <p>17 Q. Okay. And then you opine</p> <p>18 about how long it's going to take to</p> <p>19 achieve what DOJ calls Phase 3 of DFP</p> <p>20 divestiture, right?</p> <p>21 A. That is correct. Yes.</p> <p>22 Q. Okay. And what is your</p>	<p>1 DOJ has a proposal to divest what it</p> <p>2 refers to as the Ad Exchange, or AdX,</p> <p>3 right?</p> <p>4 A. That is correct.</p> <p>5 Q. Okay. And you have an</p> <p>6 opinion about how long that would take?</p> <p>7 A. Yes, I do.</p> <p>8 Q. Okay. And how long would</p> <p>9 that take, in your opinion?</p> <p>10 A. In my opinion -- and,</p> <p>11 again, I will point out to my report --</p> <p>12 the AdX should take about 18 months.</p> <p>13 And I should say this: A</p> <p>14 reasonable plan proposed in here should</p> <p>15 take 18 months. And I'm giving you just</p> <p>16 one reasonable approach to that</p> <p>17 divestiture.</p> <p>18 Q. What do you mean you're</p> <p>19 giving "just one reasonable approach to</p> <p>20 that divestiture"?</p> <p>21 A. So if you put five</p> <p>22 engineers into a room and say divest</p>

Page 82	Page 84
<p>1 AdX, you will get seven different</p> <p>2 opinions back on how that can be done.</p> <p>3 I'm giving just one</p> <p>4 reasonable approach to doing this, which</p> <p>5 doesn't mean that somebody else may not</p> <p>6 come up with a different, equally</p> <p>7 reasonable approach.</p> <p>8 Q. When you give these</p> <p>9 timeline estimates, is it fair to say it</p> <p>10 is your best guess, sitting here today,</p> <p>11 about how long something is going to</p> <p>12 take?</p> <p>13 MR. TESLICKO: Object to</p> <p>14 form.</p> <p>15 THE WITNESS: No, I -- I</p> <p>16 don't think that is fair to say.</p> <p>17 BY MS. RHEE:</p> <p>18 Q. Well, are you giving a</p> <p>19 guarantee that any one of these phases</p> <p>20 or projects can be completed within that</p> <p>21 timeframe?</p> <p>22 MR. TESLICKO: Object to</p>	<p>1 talking about three-week</p> <p>2 schedules, so two days is</p> <p>3 roughly 10 percent, which is big</p> <p>4 time -- big deal.</p> <p>5 BY MS. RHEE:</p> <p>6 Q. Mm-hmm.</p> <p>7 A. And it was on a schedule</p> <p>8 that almost all of us senior people who</p> <p>9 started working on it felt like there is</p> <p>10 no way that we are going to get this</p> <p>11 done, but...</p> <p>12 Q. Yeah. But we'll talk about</p> <p>13 your use of the Look Back video as a</p> <p>14 case study or example.</p> <p>15 But -- but since you bring</p> <p>16 that up --</p> <p>17 A. Mm-hmm.</p> <p>18 Q. -- you remember filming a</p> <p>19 video in connection with that project,</p> <p>20 right?</p> <p>21 MR. TESLICKO: Object to</p> <p>22 form.</p>
Page 83	Page 85
<p>1 form.</p> <p>2 THE WITNESS: No, I'm not</p> <p>3 giving a guarantee on any of</p> <p>4 them.</p> <p>5 BY MS. RHEE:</p> <p>6 Q. Okay. And you would agree,</p> <p>7 in your experience working on projects</p> <p>8 in industry, every project has always</p> <p>9 slipped?</p> <p>10 MR. TESLICKO: Object to</p> <p>11 form.</p> <p>12 THE WITNESS: Actually,</p> <p>13 no. And I'm going to, again,</p> <p>14 refer to my -- my report and</p> <p>15 give you an example of a project</p> <p>16 that relates there.</p> <p>17 That Facebook Look Back</p> <p>18 videos, that not only didn't</p> <p>19 slip, it came in two days ahead</p> <p>20 of schedule. Which, normally,</p> <p>21 you would go, like, who cares</p> <p>22 about two days, but we are</p>	<p>1 THE WITNESS: I'm not sure</p> <p>2 if you're talking about me</p> <p>3 giving a conference presentation</p> <p>4 at XKL in Boston.</p> <p>5 But I do remember that</p> <p>6 that is just one of the many</p> <p>7 talks, you know, technical</p> <p>8 talks, that are not listed in my</p> <p>9 résumé by, you know, line item</p> <p>10 and line item.</p> <p>11 But, yeah, I do remember</p> <p>12 giving the talk.</p> <p>13 BY MS. RHEE:</p> <p>14 Q. And, in fact, you cite it</p> <p>15 in your report.</p> <p>16 Do you know that?</p> <p>17 A. Yes. Absolutely.</p> <p>18 Q. Okay.</p> <p>19 A. Because I kind of explain</p> <p>20 in detail what was going on, and I feel</p> <p>21 that, sitting here today, you can</p> <p>22 reasonably say, oh, you're making stuff</p>

<p>Page 110</p> <p>1 up to them to decide.</p> <p>2 Completely out of my area of</p> <p>3 expertise to -- to opine on</p> <p>4 this.</p> <p>5 BY MS. RHEE:</p> <p>6 Q. So your estimate of how</p> <p>7 long something like this would take --</p> <p>8 A. Mm-hmm.</p> <p>9 Q. -- isn't dependent on</p> <p>10 whether or not any of these steps that</p> <p>11 you're walking us through --</p> <p>12 A. Mm-hmm.</p> <p>13 Q. -- because they possibly</p> <p>14 are part of the final auction logic,</p> <p>15 also need to be open-sourced?</p> <p>16 MR. TESLICKO: Object to</p> <p>17 form.</p> <p>18 THE WITNESS: All of these</p> <p>19 steps are part of the code base.</p> <p>20 My opinions are, hey, here</p> <p>21 is the code base. Do something</p> <p>22 with it.</p>	<p>Page 112</p> <p>1 of my colleagues at Facebook would be</p> <p>2 horrified.</p> <p>3 If all of these things were</p> <p>4 closely interacting with each other,</p> <p>5 coupled, looking at each other's private</p> <p>6 properties without any regard for</p> <p>7 computer standards or sort of computer</p> <p>8 coding standards, modern way of</p> <p>9 developing code, then it would make a</p> <p>10 difference, because then -- honestly, it</p> <p>11 would have to be rewritten and cleaned</p> <p>12 up before it could be outsourced.</p> <p>13 But, at least in my part of</p> <p>14 the world, one of the things that Google</p> <p>15 is certainly held in high esteem for,</p> <p>16 and in my personal experience working</p> <p>17 there, is sticking to very good computer</p> <p>18 science methodology and being really</p> <p>19 strict about how the code is checked in.</p> <p>20 And, as a matter of fact,</p> <p>21 in some of the documents that, you know,</p> <p>22 your client has presented in this</p>
<p>Page 111</p> <p>1 The process that I'm</p> <p>2 describing is agnostic to what</p> <p>3 the code base does.</p> <p>4 BY MS. RHEE:</p> <p>5 Q. I take it from your answer,</p> <p>6 your opinion is also agnostic as to how</p> <p>7 many items within that code base either</p> <p>8 need or do not need to be open-sourced?</p> <p>9 MR. TESLICKO: Object to</p> <p>10 form.</p> <p>11 THE WITNESS: Yes, and a</p> <p>12 no.</p> <p>13 BY MS. RHEE:</p> <p>14 Q. Okay.</p> <p>15 A. You know, the answer to</p> <p>16 that is, it depends.</p> <p>17 Q. What does it depend on?</p> <p>18 A. It depends on how the code</p> <p>19 is organized.</p> <p>20 So to give you a</p> <p>21 hypothetical that -- I think most of my</p> <p>22 colleagues at Google and probably most</p>	<p>Page 113</p> <p>1 case -- and I can't recall off the top</p> <p>2 of my head which ones -- they actually</p> <p>3 describe the process it goes through.</p> <p>4 Code reviews. It has to be</p> <p>5 reviewed by the -- at least one other</p> <p>6 person.</p> <p>7 But, for example, if I'm</p> <p>8 trying to do the code check-in into code</p> <p>9 base that doesn't even belong to my</p> <p>10 team, then it's going to be reviewed by</p> <p>11 one other person, and it's going to be</p> <p>12 reviewed by the owner of that particular</p> <p>13 code base or subdirectory. And those</p> <p>14 are clearly identified.</p> <p>15 So Google is pretty strict</p> <p>16 about how they maintain their code base,</p> <p>17 and, in my opinion, rightfully so.</p> <p>18 And so I've, you know, made</p> <p>19 my estimates with the understanding that</p> <p>20 that is the code base that I'm dealing</p> <p>21 with, and, therefore, I'm not going to</p> <p>22 have to rewrite it. I'm not going to</p>

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<p>1 have to completely take it apart and</p> <p>2 spend three months figuring out, you</p> <p>3 know, why is this thing directly looking</p> <p>4 and pulling something from a memory, you</p> <p>5 know, at a particular location, because</p> <p>6 that is just not allowed at Google. You</p> <p>7 don't -- you know, you don't do that.</p> <p>8 Q. Okay. For your assignment</p> <p>9 in this case --</p> <p>10 A. Mm-hmm.</p> <p>11 Q. -- you did not look at the</p> <p>12 actual source code with respect to any</p> <p>13 of these products, right?</p> <p>14 A. That is correct. Yes.</p> <p>15 Q. It was just not part of</p> <p>16 your assignment?</p> <p>17 A. That is not part of my</p> <p>18 assignment. That is correct.</p> <p>19 Q. Okay. So insofar as you</p> <p>20 talk about your assumptions --</p> <p>21 A. Mm-hmm.</p> <p>22 Q. -- about what the source</p>	<p>1 MR. TESLICKO: Object to</p> <p>2 form.</p> <p>3 THE WITNESS: That is</p> <p>4 actually incorrect.</p> <p>5 Well, I -- I worked on</p> <p>6 both AdSense and I had an intern</p> <p>7 actually do some work for</p> <p>8 AdWords. And you could argue,</p> <p>9 you know, DFP gets integrated</p> <p>10 fully after I leave Google. So</p> <p>11 not exactly this code base.</p> <p>12 However, it is a code base</p> <p>13 inside Google3. And while I was</p> <p>14 at Google, we completed</p> <p>15 integration from Google2 to</p> <p>16 Google3.</p> <p>17 And so I'm familiar with</p> <p>18 the rules, in particular for C++</p> <p>19 code base.</p> <p>20 BY MS. RHEE:</p> <p>21 Q. I just want to understand,</p> <p>22 though.</p>
Page 115	Page 117
<p>1 code looks like, that is either based on</p> <p>2 your work at Google from 2005 to 2010 or</p> <p>3 from Professor Weissman; is that right?</p> <p>4 MR. TESLICKO: Object to</p> <p>5 form.</p> <p>6 THE WITNESS: I do rely on</p> <p>7 my expertise, but it has been</p> <p>8 informed by Professor Weissman's</p> <p>9 opinions.</p> <p>10 BY MS. RHEE:</p> <p>11 Q. I see. Okay.</p> <p>12 But with respect to Google</p> <p>13 source code, specifically --</p> <p>14 A. Mm-hmm.</p> <p>15 Q. -- you stopped working at</p> <p>16 Google some time ago?</p> <p>17 A. Fifteen years ago, roughly.</p> <p>18 Yeah.</p> <p>19 Q. Okay. And even when you</p> <p>20 were working at Google, you did not have</p> <p>21 any reason or occasion to look at the</p> <p>22 source code of these products, right?</p>	<p>1 A. Mm-hmm.</p> <p>2 Q. What you're talking about</p> <p>3 in terms of your familiarity is from</p> <p>4 your time at Google, right?</p> <p>5 A. My personal familiarity,</p> <p>6 yes, it's from my time at Google.</p> <p>7 Q. Okay. And that was</p> <p>8 15 years ago?</p> <p>9 A. That was, yes. End of my</p> <p>10 time there was 15 years ago.</p> <p>11 Q. Okay. So going to this</p> <p>12 page ending in 501.</p> <p>13 [REDACTED]</p> <p>14 [REDACTED]</p> <p>15 [REDACTED]</p> <p>16 [REDACTED]</p> <p>17 [REDACTED]</p> <p>18 [REDACTED]</p> <p>19 [REDACTED]</p> <p>20 [REDACTED]</p> <p>21 [REDACTED]</p> <p>22 [REDACTED]</p>

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<p>1 said.</p> <p>2 You did rely on</p> <p>3 Mr. Levitte's testimony about GCP but</p> <p>4 not about DFP?</p> <p>5 A. No, not really. So --</p> <p>6 Q. Well, I just want to make</p> <p>7 sure, because --</p> <p>8 A. Mm-hmm.</p> <p>9 Q. -- just reading back your</p> <p>10 answer, "I relied a lot on what he was</p> <p>11 telling me about GCP, that he was</p> <p>12 confirming, basically, what I would</p> <p>13 expect about GCP."</p> <p>14 A. So I misspoke.</p> <p>15 Q. I just want --</p> <p>16 A. That is absolutely fair.</p> <p>17 You're absolutely fairly calling me out.</p> <p>18 I misspoke. I relied.</p> <p>19 I read his report and tried</p> <p>20 to sort of verify. I have public</p> <p>21 sources of information that tell me how</p> <p>22 GCP functions.</p>	<p>1 So there is nothing in his</p> <p>2 deposition that changed my opinion, that</p> <p>3 made me question or do additional</p> <p>4 research. It was just, like, all right.</p> <p>5 You know, put aside and move on.</p> <p>6 Q. So your answer just now</p> <p>7 talked about a standard you applied in</p> <p>8 deciding whether or not you would add a</p> <p>9 source to your appendix, and you said,</p> <p>10 oh, well, is it material?</p> <p>11 Have I got that right?</p> <p>12 MR. TESLICKO: Object to</p> <p>13 form.</p> <p>14 THE WITNESS: As long as</p> <p>15 you don't use "material" in some</p> <p>16 legal way that I don't know what</p> <p>17 it means.</p> <p>18 BY MS. RHEE:</p> <p>19 Q. I just really want to</p> <p>20 understand what's the standard --</p> <p>21 A. What it means to me --</p> <p>22 Q. -- what's the standard you</p>
Page 135	Page 137
<p>1 But here, I have a person</p> <p>2 that actually lives that every day of</p> <p>3 his life. This is his home.</p> <p>4 And so I read his opinion</p> <p>5 to find out if everything I know about</p> <p>6 this is consistent. Is my understanding</p> <p>7 of the space that he's describing</p> <p>8 consistent with all the public</p> <p>9 information and so on.</p> <p>10 Or, for example, if he</p> <p>11 brought up something that was completely</p> <p>12 different than the public documentation,</p> <p>13 my expectation, and so on, well, then</p> <p>14 that's material.</p> <p>15 Then I have to say either I</p> <p>16 mistrust his opinion or -- you know, or,</p> <p>17 basically, everything I know is wrong,</p> <p>18 and I have to go and dig into it deeper.</p> <p>19 But that hasn't happened.</p> <p>20 Everything he's saying is, basically,</p> <p>21 yeah, yes, yes, yes, yes, yes. Okay.</p> <p>22 Let's move on.</p>	<p>1 apply?</p> <p>2 A. Oh, perfect.</p> <p>3 So when I do my work,</p> <p>4 right, I come up -- at least my personal</p> <p>5 process and the one that a large number</p> <p>6 of the industry participants would agree</p> <p>7 with, but some tend to break -- is I</p> <p>8 want to arrive to my judgment</p> <p>9 independently.</p> <p>10 People have a tendency to</p> <p>11 run into problems when they allow</p> <p>12 themselves to be anchored.</p> <p>13 So, for example, before I</p> <p>14 start analyzing all of this, I don't</p> <p>15 want anybody telling me how long they</p> <p>16 think this should take, because as much</p> <p>17 as I deeply believe it wouldn't impact</p> <p>18 me, I'm also aware of all of the</p> <p>19 research in human psychology that says</p> <p>20 it would.</p> <p>21 And while I would really</p> <p>22 like to believe that I would be that one</p>

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1 exception, I don't need to take that
2 chance. So I want to do my work and my
3 analysis before I hear what anybody else
4 thinks about this.

5 And then, obviously, using
6 my experience, using access to any
7 publicly available source, using the
8 expertise, standard procedures, you
9 know, and processes, what you would call
10 good, you know, governance of the stuff,
11 I come up with my estimate.

12 Once I have that, once I
13 understand where I stand and I can
14 explain why I stand there, I will look
15 for what other people think about this.

16 In this, let's call it,
17 second stage of the evaluation, I am
18 trying to see is there something that I
19 have possibly, and I'm going to say
20 materially, forgotten in my analysis.

21 You know, you don't know
22 what you don't know. So at this point

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1 in time, you are looking to other people
2 to inform you did you completely miss
3 the boat.

4 I would be surprised if I
5 did, but I would also be unprofessional
6 and careless if I didn't do that
7 evaluation.

8 And at that stage, I start
9 looking for things that have timelines.
10 What are their timelines? Let's say I
11 encounter a document that has a timeline
12 that this is going to take 15 years.

13 I have to look at that
14 document seriously, because it is a
15 completely different order of magnitude
16 than my analysis. I have to understand
17 what has informed their decision, where
18 is our disagreement. And in some cases,
19 you find out -- that wasn't the case in
20 this case.

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Frankly, I called my
counsel and said, like --

MR. TESLICKO: Going to
stop you, not to disclose any

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communications with counsel.

THE WITNESS:

BY MS. RHEE:

Q. Okay. I want to unpack
what you just said. There's a lot of
information here.

So in coming up with your
initial timelines and your opinion, what
you relied upon was your experience?

A. Absolutely.

Q. Access to publicly
available sources?

A. Correct.

Q. And your expertise?

A. That is fair.

Page 142	Page 144
<p>1 And I also deployed the</p> <p>2 standard processes and procedures used</p> <p>3 in this type of an analysis. Yes.</p> <p>4 Q. Okay.</p> <p>5 A. Mm-hmm.</p> <p>6 Q. And that was the sum total</p> <p>7 so that you could stay pristine, as you</p> <p>8 put it, of what you actually relied upon</p> <p>9 in order to come up with your timelines?</p> <p>10 MR. TESLICKO: Object to</p> <p>11 form.</p> <p>12 THE WITNESS: Sorry.</p> <p>13 At that point in time, you</p> <p>14 call that first draft, right.</p> <p>15 BY MS. RHEE:</p> <p>16 Q. Okay.</p> <p>17 A. So that is the first step</p> <p>18 in the process. You kind of put your</p> <p>19 stake into the ground and say, here is</p> <p>20 what I think this should take.</p> <p>21 Q. Okay. And so did you put</p> <p>22 all of those materials into your</p>	<p>1 will know, Google will return you</p> <p>2 millions of documents.</p> <p>3 And you now sort through</p> <p>4 those documents. Typically, you sort by</p> <p>5 the validity, or let's call the</p> <p>6 engineering level of trust in the</p> <p>7 reporting source.</p> <p>8 So I'm not going to look at</p> <p>9 anything that BuzzFeed puts out. But</p> <p>10 if, you know, IP Police putting it out,</p> <p>11 that is important.</p> <p>12 Then I will look at, you</p> <p>13 know, maybe five or ten different</p> <p>14 documents, and what you find, a lot of</p> <p>15 times they overlap on, you know,</p> <p>16 90 percent of the material.</p> <p>17 I will quote you two or</p> <p>18 three documents, the minimal subset,</p> <p>19 that has all the information I relied</p> <p>20 on, packaged in the form that I relied</p> <p>21 on it.</p> <p>22 But I may have seen another</p>
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<p>1 appendices?</p> <p>2 MR. TESLICKO: Object to</p> <p>3 form.</p> <p>4 THE WITNESS: You have the</p> <p>5 list of all of the publicly</p> <p>6 available documents, yes?</p> <p>7 BY MS. RHEE:</p> <p>8 Q. No. I do. I'm asking is</p> <p>9 that --</p> <p>10 A. Yes.</p> <p>11 Q. -- everything you looked</p> <p>12 up, you looked at, to come up with your</p> <p>13 first draft, did you put in your</p> <p>14 appendices?</p> <p>15 MR. TESLICKO: Object to</p> <p>16 form.</p> <p>17 THE WITNESS: No. And</p> <p>18 allow me to explain.</p> <p>19 BY MS. RHEE:</p> <p>20 Q. Okay. Okay.</p> <p>21 A. When you're looking for</p> <p>22 publicly available information, as you</p>	<p>1 five documents that had this bit, or</p> <p>2 that bit, that is already in these three</p> <p>3 documents, that I just don't quote.</p> <p>4 You know, I have read -- I</p> <p>5 don't even know how to estimate --</p> <p>6 probably -- or skimmed, in my whole</p> <p>7 career, hundreds and thousands of</p> <p>8 documents related to these things. I'm</p> <p>9 relying on all of them in some way. I'm</p> <p>10 not going to quote them all here because</p> <p>11 they are, in my opinion, an element to</p> <p>12 the case.</p> <p>13 The parts that I quote are</p> <p>14 the sort of the minimal subset. Like,</p> <p>15 what is the highest-quality minimal</p> <p>16 subset that contains everything I have</p> <p>17 relied on.</p> <p>18 So everything I relied on</p> <p>19 has to be in there, but it can also be</p> <p>20 seen in some other documents, because --</p> <p>21 Q. Well, in documents you saw.</p> <p>22 A. Correct.</p>

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1 Q. Okay.
2 A. Because, as you see, in our
3 field people tend to cut and paste,
4 copy, and especially today, you have a
5 whole ton of AI-generated documents.
6 You know, if you're going
7 to quote all of them, like, that's going
8 to be a lot of paper wasted.
9 Q. Okay. Then in the second
10 stage --
11 A. Mm-hmm.
12 Q. -- of your evaluation --
13 A. Mm-hmm.
14 Q. -- in finalizing your
15 opinion -- is that fair to say?
16 A. Yes.
17 Q. In finalizing your opinion,
18 that's when you look for material. And
19 I think your testimony was that you may
20 have materially forgotten in your
21 analysis; is that right?
22 MR. TESLICKO: Object to

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1 form.
2 THE WITNESS: No. No. I
3 think --
4 BY MS. RHEE:
5 Q. Well, I think what you said
6 was, "I'm trying to see if there's
7 something that I have possibly, and I'm
8 going to say materially, forgotten in my
9 analysis."
10 A. Mm-hmm. That is correct.
11 That is the verification
12 stage. And so in that stage, I actually
13 start looking at other people's
14 timelines. [REDACTED]
15 [REDACTED]
16 But as you can probably
17 understand, you can't find -- if you go
18 and do the public search and say how
19 long would it take to divest the DFP,
20 even if you say -- you know, among
21 engineers, if you were to say how long
22 would it take to migrate DFP to

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1 different known proprietary environment,
2 let's search for that, you're not going
3 to find any documents with the time
4 estimate for that.
5 That type of work is
6 typically done by the company that owns
7 the product internally. It is not
8 exactly available online.
9 And so, you know, that kind
10 of information I'm hoping I'm going to
11 find somewhere. But I'm not going to
12 search for it online because I know it's
13 not available online.
14 And so in my Stage II, I am
15 trying to -- call it the testing stage.
16 I'm trying to test my work and -- and
17 look at it as if it's somebody else's
18 work and say, did the person who did
19 this work, did they do everything that
20 needed to be done? Did they encounter
21 everything? Did they do due diligence?
22 And so this is my testing

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1 due diligence stage of am I doing the
2 work at a level that I believe I should
3 be.
4 Q. Okay. And in this stage --
5 A. Mm-hmm.
6 Q. -- it looks like you
7 roughly sorted the documents to be
8 documents, as you put it, that
9 [REDACTED]?
10 MR. TESLICKO: Object
11 to --
12 THE WITNESS: No.
13 MR. TESLICKO: Object to
14 form.
15 BY MS. RHEE:
16 Q. I'm -- but you testified,
17 [REDACTED]
18 [REDACTED]
19 [REDACTED]
20 right?
21 A. That is correct. I was --
22 Q. All right. So for that

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1 category set of documents, did you put
2 each and every one of those documents in
3 your appendices?

4 A. No.

5 Q. Okay.

6 A. And I wasn't -- I don't
7 even know how I would issue a request.

8 [REDACTED]
9 [REDACTED]
10 [REDACTED]

11 So, no, that was never
12 issued.

13 Q. Well, but I --

14 A. Mm-hmm.

15 Q. That's a different issue.
16 I'm not asking for all the universe of
17 hypothetical documents that are out
18 there.

19 A. Mm-hmm.

20 Q. I'm saying, of the
21 documents, as you testified to --

22 A. Mm-hmm.

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1 Q. -- that you looked at --

2 A. Mm-hmm.

3 Q. [REDACTED]
4 [REDACTED]

5 A. Mm-hmm.

6 Q. [REDACTED]
7 [REDACTED]

8 A. Mm-hmm.

9 Q. -- did you cite each and
10 every one of those documents in your
11 appendices?

12 MR. TESLICKO: Object to
13 form.

14 THE WITNESS: No.

15 BY MS. RHEE:

16 Q. Okay.

17 A. There were some -- I've
18 cited the ones that were, let's call,
19 the most precise.

20 There were some documents
21 that, you know, arguably, you could say,
22 well, you know, how can you even make

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1 sense of this. And as an engineer, I
2 can.

3 But I also understand that
4 people outside of high-tech would just
5 sort of shake their heads and -- and not
6 know what to make of them. And so those
7 I didn't cite because I didn't think
8 they would be helpful.

9 But -- but, yeah, during
10 that stage, that's what I do.

11 Q. Okay. That's helpful.

12 And then there was a
13 category set of documents, and I believe
14 your testimony is: [REDACTED]

15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]

19 A. I'm sorry --

20 MR. TESLICKO: Object to
21 form.

22 THE WITNESS: That --

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1 what -- what are we talking
2 about there?

3 BY MS. RHEE:

4 Q. Well, this is -- this is
5 your testimony --

6 A. Yes. Yes.

7 Q. -- and you talked about
8 looking at some documents, [REDACTED]

9 [REDACTED] -- I'm just going to read you
10 your testimony.

11 [REDACTED]
12 [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]

17 MR. TESLICKO: Object to
18 form.

19 THE WITNESS: That is kind
20 of hard to unpack.

21 And I -- I want to answer
22 your question and say I think --

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1 and that's my fault because I
2 just talk a lot.
3 So there are two aspects
4 over here.
5 I say that in Stage II, it
6 is my job to do due diligence
7 and look for any information
8 that may point out there is
9 something I have forgotten.
10 During that stage is the
11 time when I look at all of the
12 Google documents. [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED] And
16 you know, I'm happy hiking
17 somewhere else.
18 But in that process, [REDACTED]
19 [REDACTED]
20 [REDACTED], and then I try
21 to understand it.
22 Because it could be like

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1 avoid to do this step of due
2 diligence, because I'm
3 testifying here and I'm doing
4 work for the plaintiffs as a
5 professional, and there is
6 certain code of behavior that
7 describes that.
8 BY MS. RHEE:
9 Q. Okay. That's very helpful.
10 A. Mm-hmm.
11 Q. So I want to understand.
12 In this process, the
13 second-stage --
14 A. The second stage, yeah.
15 Q. -- process, you acknowledge
16 you did find some documents [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 A. Yes. Correct.
20 Q. Okay. Now --
21 A. And this would be one of
22 those documents that you referred to.

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1 what has happened, [REDACTED]
2 [REDACTED]
3 [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]
11 [REDACTED]
12 [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 I would like to think that
20 as an expert in this field, that
21 wouldn't happen. And it didn't.
22 But I cannot -- I should not

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1 Q. I totally get it.
2 A. Mm-hmm.
3 Q. I'm asking, for all of
4 those documents --
5 A. Mm-hmm.
6 Q. [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 A. Mm-hmm.
10 Q. -- did you include all of
11 those documents in your appendices?
12 A. I think so. I think so. I
13 think we did.
14 And especially -- like, if
15 we referred to the document, I think
16 so -- yeah. Sorry.
17 If we referred to the
18 document, if I relied on the document,
19 definitely yes.
20 Q. Yeah. But that's not my
21 question.
22 [REDACTED] [REDACTED]

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1 clearly saw in the way that you --
2 A. Mm-hmm.
3 Q. -- answered the question,
4 it seems like it was more than one
5 document. You clearly saw, as you put
6 it, some documents where --
7 A. Mm-hmm.
8 Q. -- [REDACTED]
9 [REDACTED]
10 [REDACTED]
11 I am now asking you --
12 A. Mm-hmm.
13 Q. -- for that number of
14 unknown documents -- or unknown number
15 of documents [REDACTED]
16 [REDACTED].
17 Did you put them down, all
18 of them down, in one of your appendices?
19 A. I --
20 MR. TESLICKO: Object to
21 form.
22 [REDACTED] [REDACTED]

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1 put most of them down -- or I
2 put most of them down.
3 But I would be hesitant to
4 tell you that I put all of them
5 down.
6 However, if there is a
7 document that I haven't put down
8 [REDACTED], I
9 would be very happy to look at
10 it right now and analyze it and
11 tell you why.
12 You know, I don't think
13 there is a document like that.
14 But if there is, I would be very
15 happy to, you know, look through
16 it and tell you why I didn't
17 rely on it.
18 BY MS. RHEE:
19 Q. Okay.
20 MS. RHEE: Is it okay if
21 we take another break, because
22 I've had a lot of water.

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1 THE VIDEOGRAPHER: Off the
2 record at 11:35.
3 (Short break.)
4 THE VIDEOGRAPHER: On the
5 record at 11:48.
6 BY MS. RHEE:
7 Q. During all of these
8 breaks --
9 A. Mm-hmm.
10 Q. -- I never want to actually
11 know what, if anything, was said by
12 counsel. So I -- before Mr. Teslicko
13 jumps in and gives his warning like a
14 broken record, I just want to be very
15 clear, that is not what I'm asking.
16 A. Mm-hmm. Mm-hmm.
17 Q. But just for the record,
18 want to be assured that during all of
19 the breaks, are you talking about the
20 substance of your answers?
21 A. No. We are talking about
22 hiking.

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1 Q. Well, even there, I don't
2 want to know what -- what, in fact,
3 you're talking about, other than just
4 making sure that the substance of your
5 answers on the record are not the topic
6 of discussion.
7 A. But before I answer your
8 question, it was raised that I have
9 confused the two names.
10 I told you, I'm really
11 terrible with names. And if you look at
12 my responses to your questions, I'm
13 talking constantly about the GCP guy and
14 his response. And I thought that his
15 name was George Levitte.
16 And apparently that is not
17 his name. His name is something else.
18 Sam?
19 Q. Okay.
20 A. Let's go with Sam.
21 And so when you were asking
22 all of those questions, I was thinking

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1 VP guy?
2 Q. Okay. That's --
3 A. All right?
4 Q. -- also on the product
5 team.
6 A. On the product team. Yes.
7 I do -- okay. Yeah. I do remember
8 his -- I did read his deposition. Yes.
9 Q. Okay. You did read his
10 deposition?
11 A. Yes. Mm-hmm.
12 Q. Okay. And if you read his
13 deposition, were you aware that he also
14 testified about this document?
15 A. Do I remember in detail
16 that he talked about this document? No.
17 Q. How about just even
18 generally?
19 MR. TESLICKO: Object to
20 form.
21 THE WITNESS: No. I --
22 when I'm reading depositions,

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1 I -- I don't go and
2 cross-reference all the
3 documents that people are
4 talking about.
5 There are things through
6 the deposition -- well, I'm
7 reading them for two reasons.
8 First of all, to figure
9 out what is -- what is a
10 deposition.
11 But, second -- but --
12 BY MS. RHEE:
13 Q. Fair.
14 A. -- second, I'm kind of
15 looking for relevant information as it
16 pertains to my decisions.
17 So, for example, in case
18 of -- and I'm not going to ascribe it to
19 Mr. Craycroft because I could be wrong
20 about the name. But there is a VP of
21 ads that basically estimates the size of
22 his organization. And so that bit of

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1 information I remember because it is
2 relevant.
3 [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]
11 [REDACTED]
12 [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 [REDACTED]
20 [REDACTED]
21 [REDACTED]
22 MR. TESLICKO: Object to

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1 form.
2 [REDACTED]
3 [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 BY MS. RHEE:
8 Q. Are you aware of an
9 individual by the name of Glenn
10 Berntson?
11 A. I have read Mr. Berntson's
12 deposition.
13 Q. Okay. Yeah.
14 A. I am -- there is a reason
15 why I remember Glenn's deposition. Yes.
16 Q. Okay. So you also know
17 that he is on the product team?
18 A. He is on the product team,
19 New York office, manager. Maybe
20 director. But manager.
21 Q. And are you aware that he
22 also testified about this document?

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1 A. I am -- I don't recall the
2 part of his testimony as it pertains to
3 this document.

4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]

11 MR. TESLICKO: Object to
12 form.

13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 [REDACTED]
20 [REDACTED]
21 [REDACTED]
22 [REDACTED]

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1 A. On the product team. All
2 right. All right.

3 Q. Do you remember reading his
4 testimony?

5 A. Sitting here today, I don't
6 remember anything specific about his
7 testimony. Unlike Mr. Berntson --
8 Glenn, like, that one had a couple
9 things that pop up at me.

10 But, no, I cannot recall
11 specific parts of his testimony that
12 would stand out to me.

13 Q. Okay. So, again, sitting
14 here, you don't recall or know whether
15 or not he also was shown this document
16 and testified about it?

17 MR. TESLICKO: Object to
18 form.

19 THE WITNESS: That is fair
20 to say. Yes.

21 BY MS. RHEE:

22 Q. Okay. [REDACTED]

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1 [REDACTED]
2 [REDACTED]
3 [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]
11 [REDACTED]
12 [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 [REDACTED]
20 [REDACTED]
21 [REDACTED]
22 [REDACTED]

12 BY MS. RHEE:

13 Q. Okay. Are you familiar
14 with an individual by the name of Noam
15 Wolf?

16 A. I have heard the name Noam
17 Wolf as well.

18 If -- if you could, again,
19 put him in context, that would be
20 fantastic.

21 Q. Also an engineer on the
22 product team.

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1 [REDACTED]
2 [REDACTED]
3 [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]
11 [REDACTED]
12 [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 [REDACTED]
20 [REDACTED]
21 [REDACTED]
22 [REDACTED]

8 MR. TESLICKO: Object to
9 form.

10 [REDACTED]
11 [REDACTED]
12 [REDACTED]
13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 [REDACTED]
20 [REDACTED]
21 [REDACTED]
22 [REDACTED]

<p style="text-align: right;">Page 206</p> <p>1 MR. TESLICKO: Object to</p> <p>2 form.</p> <p>3 THE WITNESS: I have not</p> <p>4 analyzed the user consent to</p> <p>5 require user data.</p> <p>6 I am -- I'll admit I'm</p> <p>7 slightly confused as how -- who</p> <p>8 is the user that you're talking</p> <p>9 about in this case and how it</p> <p>10 applies to the Ad Exchange.</p> <p>11 And I'm not -- if you can</p> <p>12 clear up the context for me, I</p> <p>13 would be able to answer your</p> <p>14 question a little bit better,</p> <p>15 maybe.</p> <p>16 BY MS. RHEE:</p> <p>17 Q. Okay. But just sitting</p> <p>18 here today, you don't know about the</p> <p>19 role, if any, of a user in ad serving</p> <p>20 process?</p> <p>21 MR. TESLICKO: Object to</p> <p>22 form.</p>	<p style="text-align: right;">Page 208</p> <p>1 referring to different user.</p> <p>2 And -- and that's why I'm asking</p> <p>3 you for qualification -- for --</p> <p>4 sorry -- for clarification,</p> <p>5 because it can mean a publisher.</p> <p>6 You could reasonably say a</p> <p>7 publisher is a user of -- of</p> <p>8 DFP.</p> <p>9 BY MS. RHEE:</p> <p>10 Q. Okay.</p> <p>11 A. But you could also</p> <p>12 reasonably say, no, that's not a user;</p> <p>13 it's the ad agency that the publisher is</p> <p>14 employing that is the user of DFP.</p> <p>15 They are certainly not</p> <p>16 users of the -- of the buyer-side,</p> <p>17 right. So there you have advertisers,</p> <p>18 and they are the users.</p> <p>19 And, unfortunately, the</p> <p>20 term "user" means different things in</p> <p>21 different contexts.</p> <p>22 Q. Okay. You rely upon</p>
<p style="text-align: right;">Page 207</p> <p>1 THE WITNESS: No. I -- I</p> <p>2 would say that a "user" is a</p> <p>3 very loaded term here -- maybe</p> <p>4 loaded is a bad word.</p> <p>5 But it can have multiple</p> <p>6 meanings.</p> <p>7 When you say user, do you</p> <p>8 mean an advertiser? Do you mean</p> <p>9 a publisher? Who do you mean?</p> <p>10 BY MS. RHEE:</p> <p>11 Q. Okay. But you haven't come</p> <p>12 across the use of the term "user" in</p> <p>13 stat materials?</p> <p>14 MR. TESLICKO: Object to</p> <p>15 form.</p> <p>16 THE WITNESS: Sorry.</p> <p>17 I have come across the use</p> <p>18 of that term, and I have used it</p> <p>19 -- I have found it in different</p> <p>20 contexts.</p> <p>21 And so in different</p> <p>22 contexts, it was simply</p>	<p style="text-align: right;">Page 209</p> <p>1 Dr. Weissman's analysis, I think, as you</p> <p>2 put it, the analysis of the source code</p> <p>3 and data flow in AdX and DFP; is that</p> <p>4 right?</p> <p>5 A. Yes. That is correct.</p> <p>6 Q. Okay. What data flow do</p> <p>7 you believe Dr. Weissman reviewed in the</p> <p>8 source code?</p> <p>9 A. So, genuinely, I would</p> <p>10 refer you to Dr. Weissman's document on</p> <p>11 this because he kind of defines the</p> <p>12 details.</p> <p>13 But, for me, what was</p> <p>14 really important in his analysis were</p> <p>15 two things.</p> <p>16 I've asked for specific</p> <p>17 information about the code base to</p> <p>18 verify that it still keeps the same</p> <p>19 characteristics that it had when I last</p> <p>20 worked in it, and that information was</p> <p>21 provided to me.</p> <p>22 And --</p>

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<p>1 Q. How was that provided to</p> <p>2 you when you didn't look at the source</p> <p>3 code yourself?</p> <p>4 A. So it was provided to me --</p> <p>5 I had access to Dr. Weissman's draft</p> <p>6 report before the first round of our</p> <p>7 report submittal.</p> <p>8 So don't quote me on the</p> <p>9 date, but July.</p> <p>10 MR. TESLICKO: Instruct</p> <p>11 you not to discuss drafts</p> <p>12 because they are carved out by</p> <p>13 the expert stipulation.</p> <p>14 BY MS. RHEE:</p> <p>15 Q. Are you going to follow</p> <p>16 counsel's instruction not to answer that</p> <p>17 question?</p> <p>18 A. Yeah.</p> <p>19 Q. Okay.</p> <p>20 A. I'm sorry. But yeah.</p> <p>21 Q. I had to ask.</p> <p>22 Okay.</p>	<p>1 that's the total? There's nothing else?</p> <p>2 A. I have also reviewed</p> <p>3 Dr. Weissman's reports themselves, in</p> <p>4 particular, portions that discuss what</p> <p>5 we have referred to -- that could be</p> <p>6 relevant to the things that we are</p> <p>7 talking about, Stage I and Stage II of</p> <p>8 DFP divestiture, because in those stages</p> <p>9 the -- he's discussing the ability to</p> <p>10 create APIs and the ability to cut out a</p> <p>11 code and open-source that portion of the</p> <p>12 code.</p> <p>13 And I'm relying on his</p> <p>14 expert opinion that the code is -- it is</p> <p>15 possible to do those things.</p> <p>16 Q. Okay. In particular, you</p> <p>17 seem to spend some time looking at what</p> <p>18 you referred to as Dr. Weissman's source</p> <p>19 code statistics; is that right?</p> <p>20 A. That is correct.</p> <p>21 Q. Okay. And what do you</p> <p>22 understand Dr. Weissman to have done to</p>
Page 211	Page 213
<p>1 A. You're doing your job.</p> <p>2 Q. I just want to make clear,</p> <p>3 since you did not look at the source</p> <p>4 code yourself, did you have access to</p> <p>5 anything that Dr. Weissman did that is</p> <p>6 not set forth in his final reports?</p> <p>7 A. No. I have not relied on</p> <p>8 anything other than that -- other than</p> <p>9 Dr. Weissman's analysis and his report.</p> <p>10 Q. Okay. So insofar as you</p> <p>11 make reference to relying upon</p> <p>12 Dr. Weissman's source code analysis --</p> <p>13 A. Mm-hmm.</p> <p>14 Q. -- that analysis is what</p> <p>15 Dr. Weissman sets out in his report and</p> <p>16 in his source code appendix; is that</p> <p>17 right?</p> <p>18 A. That is correct.</p> <p>19 MR. TESLICKO: Object to</p> <p>20 form.</p> <p>21 BY MS. RHEE:</p> <p>22 Q. Okay. And that's -- and</p>	<p>1 put together his source code metrics</p> <p>2 that he sets out in his source code</p> <p>3 appendix?</p> <p>4 A. So I have seen some of the</p> <p>5 statements that Dr. Weissman lists. He</p> <p>6 happens to use SQL to obtain this</p> <p>7 information.</p> <p>8 For me, there are specific</p> <p>9 things that I have asked for about the</p> <p>10 code base, and I have obtained the</p> <p>11 information that I have asked for.</p> <p>12 Q. Okay. Where do you set out</p> <p>13 what is the information that you asked</p> <p>14 for and the information you obtained?</p> <p>15 A. Oh, in the table where I</p> <p>16 list the source code information.</p> <p>17 That's the information that I asked for.</p> <p>18 That's the information that I obtained.</p> <p>19 Q. I see. So what you asked</p> <p>20 for were these source code metrics?</p> <p>21 A. That is correct. Yes.</p> <p>22 Q. Okay. I see. I see.</p>

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<p>1 So what specifically did</p> <p>2 you ask for?</p> <p>3 MR. TESLICKO: I'm just</p> <p>4 going to instruct you not to</p> <p>5 disclose the substance of any</p> <p>6 communications with Keystone or</p> <p>7 with counsel.</p> <p>8 THE WITNESS: Mm-hmm.</p> <p>9 So when I have worked at</p> <p>10 Google, I had an insight, and I</p> <p>11 was, you know, inside Google3,</p> <p>12 and I looked at some of the</p> <p>13 stuff.</p> <p>14 And so what I'm looking</p> <p>15 for over here is, is the code</p> <p>16 base still what I would consider</p> <p>17 clean and healthy code base.</p> <p>18 And there are a couple of things</p> <p>19 that can tell you that.</p> <p>20 Not a single line in that</p> <p>21 table by itself necessarily</p> <p>22 means much. But, in general,</p>	<p>1 C++ code base has, I don't know,</p> <p>2 tens of thousands of files and</p> <p>3 they are all smaller than 25 to</p> <p>4 30 lines of code. That would</p> <p>5 give me a pause.</p> <p>6 What's going here. Like,</p> <p>7 why would anybody do this. And</p> <p>8 I would question what kind of</p> <p>9 code base I'm dealing with.</p> <p>10 So these are sort of --</p> <p>11 consider them health checks,</p> <p>12 right.</p> <p>13 If you were to go to a</p> <p>14 doctor and they do a blood test</p> <p>15 and they look at the number of</p> <p>16 parameters, you look at it and</p> <p>17 say is this person healthy, and</p> <p>18 you basically make a decision</p> <p>19 that, yeah, this -- this is a</p> <p>20 healthy person.</p> <p>21 Now, that really does not</p> <p>22 mean, necessarily, that the</p>
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<p>1 you're looking at -- and, again,</p> <p>2 I make predictions about the</p> <p>3 code base before I get the</p> <p>4 confirmation.</p> <p>5 So I would expect AdX to,</p> <p>6 for example, be smaller than all</p> <p>7 of the utilities.</p> <p>8 Is that -- is that true?</p> <p>9 Yes, it is.</p> <p>10 I would expect DFP, to a</p> <p>11 little bit, be -- be a little</p> <p>12 bit bigger than AdX but, again,</p> <p>13 smaller than utilities. Is that</p> <p>14 true? Yes.</p> <p>15 So those kinds of things</p> <p>16 are consistent with my</p> <p>17 expectations.</p> <p>18 But here are the other</p> <p>19 things that I want to see.</p> <p>20 Let's say you are talking about,</p> <p>21 as we are here, about C++ code</p> <p>22 base, and you find out that the</p>	<p>1 person is not suffering from</p> <p>2 something you don't see.</p> <p>3 But nine times out --</p> <p>4 actually, I would say 99 times</p> <p>5 out of 100, it gives you a</p> <p>6 really clear insight in what</p> <p>7 you're dealing with.</p> <p>8 And that is kind of -- the</p> <p>9 simple statistics can tell you</p> <p>10 how -- how clean is this code</p> <p>11 base.</p> <p>12 And for me, it confirmed</p> <p>13 that Google has continued with</p> <p>14 their practice of being diligent</p> <p>15 and professional and strict</p> <p>16 about what they allow in and out</p> <p>17 of the code base.</p> <p>18 BY MS. RHEE:</p> <p>19 Q. Okay. We're going to go to</p> <p>20 the details of this --</p> <p>21 A. Mm-hmm.</p> <p>22 Q. -- table in a minute but --</p>

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<p>1 A. All good.</p> <p>2 Q. -- but based on your</p> <p>3 answer, I have some follow-ups for you.</p> <p>4 A. Sure.</p> <p>5 Q. You likened this to a</p> <p>6 health check.</p> <p>7 A. I just did.</p> <p>8 Q. Okay. Do you have either a</p> <p>9 textbook citation, a manual citation, an</p> <p>10 industry citation that lays out the kind</p> <p>11 of health check methodology that you</p> <p>12 just walked us through --</p> <p>13 MR. TESLICKO: Objection.</p> <p>14 BY MS. RHEE:</p> <p>15 Q. -- where, you know,</p> <p>16 counting the number of files and lines</p> <p>17 of code is a way to do this kind of</p> <p>18 health check, where, as you put it,</p> <p>19 nine -- nine times out of ten it tells</p> <p>20 you helpful information about the</p> <p>21 person's health?</p> <p>22 MR. TESLICKO: Object to</p>	<p>1 programatically so that the</p> <p>2 number of lines of code will be</p> <p>3 exactly the same as the number</p> <p>4 of -- number of files you're</p> <p>5 dealing with.</p> <p>6 Because lines don't mean</p> <p>7 anything to the computers. They</p> <p>8 mean something to the</p> <p>9 programmers.</p> <p>10 And so people can, and</p> <p>11 they do, make a very reasonable</p> <p>12 argument by saying, so lines of</p> <p>13 code are meaningless.</p> <p>14 BY MS. RHEE:</p> <p>15 Q. What -- do you cite to any</p> <p>16 of that literature?</p> <p>17 A. No, I don't.</p> <p>18 Q. Okay.</p> <p>19 A. Because it's -- it's an</p> <p>20 ongoing discussion. And I think it's</p> <p>21 going to be -- I don't think it's ever</p> <p>22 going to be resolved. It is just one of</p>
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<p>1 form.</p> <p>2 THE WITNESS: Understood.</p> <p>3 So you can find tremendous</p> <p>4 number of discussions about this</p> <p>5 topic in particular lines of</p> <p>6 code.</p> <p>7 I personally have totally</p> <p>8 objected when people have used</p> <p>9 lines of code in contexts that I</p> <p>10 felt were completely and utterly</p> <p>11 inappropriate for.</p> <p>12 And you could also make an</p> <p>13 argument that, well, you're</p> <p>14 talking about roughly</p> <p>15 one-and-a-half-million lines of</p> <p>16 code for AdX. Can all of that</p> <p>17 code be rearranged so that the</p> <p>18 number of lines changes to be</p> <p>19 something a lot smaller?</p> <p>20 Absolutely.</p> <p>21 You could rewrite all of</p> <p>22 the code probably</p>	<p>1 those philosophical topics where lines</p> <p>2 of code -- it depends on what you use</p> <p>3 the metric for.</p> <p>4 You will find my work</p> <p>5 strongly objecting to industry</p> <p>6 benchmarks in performance testing.</p> <p>7 And if you take it out of</p> <p>8 context, you would say, all right, so</p> <p>9 you're against benchmarks. Why did you</p> <p>10 then spend all of your time at Google</p> <p>11 wasting their money writing benchmarks.</p> <p>12 And, you know, it would feel that way.</p> <p>13 I object to what people use</p> <p>14 benchmarks for. It -- benchmarks give</p> <p>15 you very useful information.</p> <p>16 So in case of Google,</p> <p>17 benchmarks enabled my development</p> <p>18 partners to quickly find out. I write</p> <p>19 something that allows them early in the</p> <p>20 morning to look and say, did I make a</p> <p>21 giant performance blunder yesterday</p> <p>22 without realizing I was doing that.</p>

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<p>1 That was the purpose of the</p> <p>2 benchmark. It was incredibly valuable.</p> <p>3 Now, if you take that</p> <p>4 benchmark and you say, and this</p> <p>5 benchmark proves that the code for</p> <p>6 rightly is far better performed than the</p> <p>7 code for something else, I'm going to</p> <p>8 object to that. It wasn't written for</p> <p>9 that. That is not the purpose of that</p> <p>10 benchmark.</p> <p>11 So in the discussion of</p> <p>12 lines of code, they can be both very</p> <p>13 useful and useless.</p> <p>14 Okay. If a manager uses</p> <p>15 lines of code to promote people, like, I</p> <p>16 get hives. That is such a stupid</p> <p>17 statistic to use in that context. So if</p> <p>18 you use lines of code in that context,</p> <p>19 yeah, they are -- they are terrible.</p> <p>20 But if you use lines of</p> <p>21 code and say, these are reasonable lines</p> <p>22 of code written by engineers who were</p>	<p>1 answer your question "no."</p> <p>2 But I'm also not</p> <p>3 referencing GAM on the standards</p> <p>4 of C++ language. It's just C++,</p> <p>5 you know, so --</p> <p>6 BY MS. RHEE:</p> <p>7 Q. I know.</p> <p>8 But I'm asking as a</p> <p>9 methodological matter, insofar as you're</p> <p>10 positing that this is a sound means --</p> <p>11 A. Mm-hmm.</p> <p>12 Q. -- to do a health check,</p> <p>13 can you cite to anything that supports</p> <p>14 that proposition?</p> <p>15 MR. TESLICKO: Object to</p> <p>16 form.</p> <p>17 THE WITNESS: I am certain</p> <p>18 I can find those references for</p> <p>19 you and would be happy to</p> <p>20 provide them for you.</p> <p>21 BY MS. RHEE:</p> <p>22 Q. Okay. But you don't have</p>
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<p>1 not trying to get promoted by just</p> <p>2 writing more lines and -- and roughly</p> <p>3 describe the size of the project, then</p> <p>4 that actually makes sense.</p> <p>5 Q. I'm asking --</p> <p>6 A. Mm-hmm.</p> <p>7 Q. -- insofar as you think in</p> <p>8 this context --</p> <p>9 A. Mm-hmm.</p> <p>10 Q. -- i.e., assessing</p> <p>11 timelines and complexity --</p> <p>12 A. Mm-hmm.</p> <p>13 Q. -- do you have any</p> <p>14 references to literature anywhere that</p> <p>15 says, looking at these kind of simple</p> <p>16 statistics --</p> <p>17 A. Mm-hmm.</p> <p>18 Q. -- is actually, as you put</p> <p>19 it, a good health check?</p> <p>20 MR. TESLICKO: Object to</p> <p>21 form.</p> <p>22 THE WITNESS: So I will</p>	<p>1 it right now in any of your appendices?</p> <p>2 A. No. I really didn't think</p> <p>3 we would be discussing such basic things</p> <p>4 that kind of a general agreement.</p> <p>5 As I said, I also don't</p> <p>6 cite anything on the history and</p> <p>7 development of C++.</p> <p>8 Those things are just, you</p> <p>9 know, building blocks. Let's call them</p> <p>10 building blocks of the whole process,</p> <p>11 so...</p> <p>12 Q. Okay. Okay.</p> <p>13 A. But if you would like me</p> <p>14 to, I will happily provide you with, you</p> <p>15 know, references for all of those</p> <p>16 things.</p> <p>17 Q. Okay. Thank you.</p> <p>18 MS. RHEE: Is now a good</p> <p>19 time to take a lunch break?</p> <p>20 MR. TESLICKO: Sure.</p> <p>21 Let's go off the record.</p> <p>22 THE VIDEOGRAPHER: Off the</p>

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1 record at 12:44.
2 - - -
3 (Whereupon, a luncheon
4 recess was taken.)
5 - - -
6 A F T E R N O O N P R O C E E D I N G S
7 - - -
8 THE VIDEOGRAPHER: On the
9 record at 1:23.
10 - - -
11 CONTINUED EXAMINATION
12 - - -
13 BY MS. RHEE:
14 Q. Okay. So we left off
15 talking about this source code metric
16 table.
17 Do you recall?
18 A. Yes, I do recall.
19 Q. Okay. So why don't we
20 actually look at the -- no pun
21 intended -- the source.
22 A. Mm-hmm.

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1 Q. I'm going to get what I
2 hope is the Weissman Table 2, from his
3 source code appendix.
4 MS. RHEE: Thank you so
5 much, Anita.
6 (Document marked for
7 identification as Bjedov
8 Exhibit 3.)
9 THE WITNESS: Am I allowed
10 to start looking at it?
11 BY MS. RHEE:
12 Q. Oh, yes, of course.
13 A. I wasn't sure.
14 Q. Of course.
15 What I'm directing your
16 attention to, because I think you
17 replicate it --
18 A. Mm-hmm.
19 Q. -- in your own report, is
20 this Table 2 called "Source Code
21 Metrics."
22 Do you see that?

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1 A. Mm-hmm. I do.
2 Q. Okay. And this is a
3 running of a tool to basically do counts
4 of each of these items, right?
5 A. Yeah. You can -- so
6 Professor Weissman used the tools that
7 he prefers.
8 I -- I would get the same
9 numbers using standard Unix commands,
10 provided that the repo is available
11 through -- through Unix, which I think
12 it is.
13 Q. It's a pretty simple -- you
14 know, a tool or piece of code just to
15 count.
16 A. Yeah. You count and grip,
17 and -- yeah. But sure.
18 Q. Okay. And then what he's
19 counting are the number of files --
20 A. Mm-hmm.
21 Q. -- classes, functions, and
22 code lines for what he puts in these

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1 columns: Supermixer, BOW, AdX, and GFP.
2 Fair?
3 A. That is -- that is correct.
4 Yeah.
5 Q. Okay. And you see the
6 count for this column titled "AdX" to be
7 the complete count of source code
8 associated with AdX?
9 MR. TESLICKO: Object to
10 form.
11 THE WITNESS: I would say
12 absolutely not.
13 This is really more of
14 a -- you know, let's call it --
15 let's call it server-side stuff.
16 So I would not expect the
17 front-end code to be written in
18 C++.
19 And I would not expect to
20 find it in this directory. It
21 would be odd to do that.
22 BY MS. RHEE:

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<p>1 pleasure of interacting with.</p> <p>2 From the ability to just</p> <p>3 list files, which files are in this</p> <p>4 directory, ls, to the things like what</p> <p>5 is the name of the kernel that -- that</p> <p>6 you are running. You name ls-a.</p> <p>7 All of those commands, they</p> <p>8 are a part of operating system, but they</p> <p>9 are -- let's say they are not the core</p> <p>10 part. They are not the kernel, but they</p> <p>11 are called utilities.</p> <p>12 And so I'm talking about</p> <p>13 utilities of these things that you</p> <p>14 really need in order to provide the</p> <p>15 service you're providing. But they are</p> <p>16 not necessarily the part of your core.</p> <p>17 So in case of AdX, you will</p> <p>18 say it's an exchange. Its core part is</p> <p>19 the exchange.</p> <p>20 But, you know, it may</p> <p>21 realize -- so, for example, you can</p> <p>22 utilize in BOW for a lot of things. BOW</p>	<p>1 A. Very close.</p> <p>2 I would say that there are</p> <p>3 certainly functions inside BOW and</p> <p>4 inside Supermixer. Supermixer is</p> <p>5 probably, again, most likely its own</p> <p>6 product. But certainly inside BOW, that</p> <p>7 the buyer would have to get the copy of.</p> <p>8 All of them, I cannot tell</p> <p>9 you that, but certainly a fair number of</p> <p>10 it.</p> <p>11 Because as you will see,</p> <p>12 BOW being the -- what's called the</p> <p>13 utility-type part of the code base, is</p> <p>14 larger than the rest of the stuff.</p> <p>15 And so there could be parts</p> <p>16 in BOW that apply just to AdX. There</p> <p>17 could be parts that apply to just the</p> <p>18 DFP. There could be parts in BOW that</p> <p>19 support Supermixer itself. And there</p> <p>20 could be some parts that are used by all</p> <p>21 three.</p> <p>22 But there could be other</p>
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<p>1 is those utilities that basically</p> <p>2 removes some responsibility from AdX to</p> <p>3 allow AdX to be lean, mean, and operate</p> <p>4 cleanly. But AdX can call it and say,</p> <p>5 hey, give me this.</p> <p>6 So a very, I would say,</p> <p>7 advanced or -- the right way to develop</p> <p>8 computer systems.</p> <p>9 Q. Okay. But the upshot is, I</p> <p>10 think, based on your earlier</p> <p>11 testimony --</p> <p>12 A. Mm-hmm. Mm-hmm.</p> <p>13 Q. -- is it's your opinion</p> <p>14 that BOW and Supermixer need to be</p> <p>15 divested, along with what you're calling</p> <p>16 core AdX --</p> <p>17 A. Mm-hmm.</p> <p>18 Q. -- in order to provide the</p> <p>19 functionality that an acquirer would</p> <p>20 expect.</p> <p>21 Is that -- have I got your</p> <p>22 testimony right?</p>	<p>1 parts they use by one or two or -- there</p> <p>2 are probably even parts that are not</p> <p>3 used by anybody and haven't been removed</p> <p>4 from the code base for either historical</p> <p>5 or -- or, actually, strategic reasons.</p> <p>6 So parts of it would have</p> <p>7 to certainly be provided to the</p> <p>8 purchaser to make AdX work.</p> <p>9 The other parts, Google</p> <p>10 could reasonably say, well, this is not</p> <p>11 necessary to make AdX work, and,</p> <p>12 therefore, we are not going to be</p> <p>13 providing it.</p> <p>14 Q. Okay. So would you</p> <p>15 consider BOW and Supermixer to be a</p> <p>16 dependency of AdX and DFP?</p> <p>17 A. I would not use the term</p> <p>18 "dependency."</p> <p>19 I would say that AdX relies</p> <p>20 on them, because they are really more --</p> <p>21 they are kind of on the same level, if</p> <p>22 that makes sense.</p>

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<p>1 And so they --</p> <p>2 Q. It doesn't make sense.</p> <p>3 A. All right.</p> <p>4 Q. This is why I'm asking the</p> <p>5 question, because -- I mean, let's just</p> <p>6 level set.</p> <p>7 You are familiar with,</p> <p>8 because you use it in your own report --</p> <p>9 A. Mm-hmm.</p> <p>10 Q. -- and certainly</p> <p>11 Dr. Weissman uses it in his, and you</p> <p>12 rely upon --</p> <p>13 A. Mm-hmm.</p> <p>14 Q. -- this notion of a</p> <p>15 dependency, right?</p> <p>16 A. Absolutely. Yes.</p> <p>17 Q. Okay. And how long a</p> <p>18 divestiture takes or your step of</p> <p>19 technical decoupling --</p> <p>20 A. Mm-hmm.</p> <p>21 Q. -- depends on both the</p> <p>22 number of dependencies and the</p>	<p>1 dependency, and you refer to a</p> <p>2 dependency, and what you're describing</p> <p>3 here for Supermixer and BOW, which you</p> <p>4 do not call a dependency --</p> <p>5 A. Mm-hmm.</p> <p>6 Q. -- but instead call a</p> <p>7 related utility system?</p> <p>8 A. So in my example, when I</p> <p>9 was describing UNIX, I wouldn't say that</p> <p>10 UNIX kernel depends on utilities. It's</p> <p>11 just they -- they are -- there is</p> <p>12 kernel, there is utilities, but they are</p> <p>13 one, right?</p> <p>14 And even though you could</p> <p>15 separate them by code base, you compile</p> <p>16 them differently and separately and so</p> <p>17 on, they -- from the computer science</p> <p>18 standpoint and from the practitioner</p> <p>19 standpoint, you would never -- I don't</p> <p>20 think any engineer would say, oh, when I</p> <p>21 say UNIX, I mean UNIX kernel, and I</p> <p>22 think UNIX Utilities, right, is</p>
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<p>1 complexity of those dependencies, right?</p> <p>2 MR. TESLICKO: Object to</p> <p>3 form.</p> <p>4 THE WITNESS: Not exactly.</p> <p>5 That's a very -- because, again,</p> <p>6 the parallelization comes to the</p> <p>7 issue.</p> <p>8 In the strictest technical</p> <p>9 term, you could really say that</p> <p>10 all four of these most likely</p> <p>11 depend on each other and call</p> <p>12 each other.</p> <p>13 Now, do they call</p> <p>14 everything inside BOW? No --</p> <p>15 BY MS. RHEE:</p> <p>16 Q. No. Understood --</p> <p>17 A. But some aspects of it, for</p> <p>18 sure.</p> <p>19 Q. Right. But that's the</p> <p>20 reason why I'm asking.</p> <p>21 What's the difference</p> <p>22 between how Dr. Weissman refers to, as a</p>	<p>1 dependencies.</p> <p>2 We just say UNIX. It's the</p> <p>3 product. It's the kernel. It contains</p> <p>4 all of the utilities. We use it as one.</p> <p>5 Q. Yeah. But when we're</p> <p>6 talking about UNIX here, we're talking</p> <p>7 about internal Google infrastructure and</p> <p>8 its product --</p> <p>9 A. Product.</p> <p>10 Q. -- source code.</p> <p>11 A. Mm-hmm.</p> <p>12 Q. So here I just want to be</p> <p>13 clear --</p> <p>14 A. Mm-hmm.</p> <p>15 Q. -- about what your</p> <p>16 testimony is.</p> <p>17 Your view is that BOW and</p> <p>18 Supermixer, vis-à-vis AdX and DFP, are</p> <p>19 not dependencies.</p> <p>20 MR. TESLICKO: Object to</p> <p>21 form.</p> <p>22 THE WITNESS: I would call</p>

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<p>1 missed it, personally, I would</p> <p>2 be absolutely stunned.</p> <p>3 And based on Professor</p> <p>4 Weissman's credentials,</p> <p>5 expertise, and his work, I see</p> <p>6 no reason to even contemplate</p> <p>7 that hypothetical.</p> <p>8 You are suggesting that he</p> <p>9 doesn't have the -- truly, the</p> <p>10 basic level of competence.</p> <p>11 To give you an example of</p> <p>12 how easy it is, I literally</p> <p>13 would have to say, "Grab AdX</p> <p>14 recursively," and I'm going to</p> <p>15 get the whole thing.</p> <p>16 And I personally cannot</p> <p>17 imagine scenario in which an</p> <p>18 expert of Professor Weissman's</p> <p>19 caliber would be unfamiliar with</p> <p>20 that.</p> <p>21 But if you -- if you can</p> <p>22 show me that, obviously, it</p>	<p>1 use.</p> <p>2 I would say that this is</p> <p>3 his area of expertise and not</p> <p>4 mine, and so, frankly, I'm</p> <p>5 looking forward to the</p> <p>6 opportunity to find out why he</p> <p>7 wouldn't use the things that I</p> <p>8 would use. But it's also been</p> <p>9 six years since I last have done</p> <p>10 it.</p> <p>11 But I would be -- between</p> <p>12 the two of us, I would trust his</p> <p>13 tools more than I would trust</p> <p>14 mine, and I know that my tools</p> <p>15 would answer this in, like,</p> <p>16 split second.</p> <p>17 So on this topic, he is</p> <p>18 the expert, and I'm just, you</p> <p>19 know, a random person down the</p> <p>20 street.</p> <p>21 BY MS. RHEE:</p> <p>22 Q. So if it's Professor</p>
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<p>1 would change how I look at the</p> <p>2 stuff, because, then,</p> <p>3 information that I have been</p> <p>4 relying on is inaccurate.</p> <p>5 BY MS. RHEE:</p> <p>6 Q. Okay. So if it turned out</p> <p>7 Professor Weissman did not do what</p> <p>8 you're suggesting, which is run the tool</p> <p>9 at the top level of each of these</p> <p>10 folders, but, instead, he actually went</p> <p>11 to each of those folder paths and then</p> <p>12 ran the count within each folder, what</p> <p>13 would be your response to that</p> <p>14 methodology?</p> <p>15 A. My --</p> <p>16 MR. TESLICKO: Object to</p> <p>17 form.</p> <p>18 THE WITNESS: My response</p> <p>19 would be that I've seen parts of</p> <p>20 the tools that Professor</p> <p>21 Weissman is using and they are</p> <p>22 different than the ones I would</p>	<p>1 Weissman's testimony that this Table 2</p> <p>2 is not meant to represent all of the</p> <p>3 available files or directories</p> <p>4 associated with AdX or DFP, how useful</p> <p>5 is it to you in your health check?</p> <p>6 A. Very useful, because keep</p> <p>7 in mind that I am not using this table</p> <p>8 to say, oh, there is 400 -- sorry --</p> <p>9 4,659,000 lines of code. That's not --</p> <p>10 that number is irrelevant.</p> <p>11 I'm looking for the</p> <p>12 patterns. I am -- these numbers inform</p> <p>13 my decision on is this code base what I</p> <p>14 would expect a Google3 code base to</p> <p>15 behave like and look like.</p> <p>16 Q. I just want to pause --</p> <p>17 A. Mm-hmm.</p> <p>18 Q. -- because, at least in</p> <p>19 earlier testimony, you told us the</p> <p>20 reason why this was relevant to you --</p> <p>21 A. Mm-hmm.</p> <p>22 Q. -- is because the numbers</p>

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<p>1 in the columns for BOW and Supermixer --</p> <p>2 A. Mm-hmm.</p> <p>3 Q. -- are bigger than the</p> <p>4 numbers in the columns for AdX and GFP.</p> <p>5 MR. TESLICKO: Object to</p> <p>6 form.</p> <p>7 BY MS. RHEE:</p> <p>8 Q. Fair?</p> <p>9 A. No. I told you that what</p> <p>10 I'm looking for -- those are some of the</p> <p>11 numbers that I'm looking for.</p> <p>12 I'm looking to identify</p> <p>13 utilities, and I know that the utilities</p> <p>14 will be bigger than the other files and</p> <p>15 so on.</p> <p>16 Q. Well, you're looking to see</p> <p>17 if they are going to be bigger --</p> <p>18 A. Yes.</p> <p>19 Q. -- than the files, as you</p> <p>20 put it, for AdX and DFP.</p> <p>21 A. That is correct. Yes.</p> <p>22 Q. Okay. So if it turns out</p>	<p>1 have information that shows</p> <p>2 otherwise, but this is my</p> <p>3 working premise.</p> <p>4 His analysis may have been</p> <p>5 incomplete, but it's going to be</p> <p>6 incomplete in that case.</p> <p>7 And -- and I do want to</p> <p>8 say, this is your stipulation.</p> <p>9 The parameters that I disagree</p> <p>10 with, it's going to be</p> <p>11 incomplete in exactly the same</p> <p>12 way in all four of these --</p> <p>13 BY MS. RHEE:</p> <p>14 Q. Well, you don't know that,</p> <p>15 sitting here, right, because you don't</p> <p>16 know -- because you don't know what's</p> <p>17 contained underneath each of these</p> <p>18 top-line directories, or, I guess, they</p> <p>19 are referred to as top-level folders,</p> <p>20 how many folders are associated with BOW</p> <p>21 and Supermixer that are not part of</p> <p>22 these particular folder paths that</p>
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<p>1 that, because what Dr. Weissman did in</p> <p>2 order to get to the counts for the</p> <p>3 columns associated with AdX and DFP are</p> <p>4 incomplete, and you don't actually know</p> <p>5 what those numbers are, how can you do</p> <p>6 the comparison of what those actual</p> <p>7 numbers are, to the numbers for the</p> <p>8 related utilities?</p> <p>9 MR. TESLICKO: Object to</p> <p>10 form.</p> <p>11 THE WITNESS: So Professor</p> <p>12 Weissman used a process and a</p> <p>13 methodology to obtain these</p> <p>14 numbers.</p> <p>15 My starting assumption is</p> <p>16 that Professor Weissman did not</p> <p>17 intentionally try to deceive the</p> <p>18 court and has relied on his</p> <p>19 expertise, so he has used</p> <p>20 exactly the same process in all</p> <p>21 four of these directories.</p> <p>22 And, you know, maybe you</p>	<p>1 Dr. Weissman describes, right?</p> <p>2 MR. TESLICKO: Object to</p> <p>3 form.</p> <p>4 THE WITNESS: So the issue</p> <p>5 here is the process, right.</p> <p>6 He is doing the process,</p> <p>7 trying to identify these files.</p> <p>8 Let's assume that that</p> <p>9 process -- and, again, I</p> <p>10 disagree with this hypothetical</p> <p>11 strongly.</p> <p>12 And I am not trying to at</p> <p>13 all suggest that Professor</p> <p>14 Weissman would make this</p> <p>15 mistake, because I don't -- if</p> <p>16 you look at his credentials and</p> <p>17 so on, as far as I'm concerned,</p> <p>18 he is the expert in this area.</p> <p>19 But, even, let's say,</p> <p>20 entertaining your hypothetical,</p> <p>21 he's using a process, and that</p> <p>22 process will produce the same</p>

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<p>1 type of an adder in all four of</p> <p>2 these columns.</p> <p>3 And what I'm looking for</p> <p>4 is things between them and</p> <p>5 things even around the columns,</p> <p>6 ratios, total numbers, and so</p> <p>7 on, to inform my opinion.</p> <p>8 So if you could give me</p> <p>9 any sort of description of what</p> <p>10 kind of mistake could you be</p> <p>11 thinking about that -- that we</p> <p>12 could do, even, you know, me, if</p> <p>13 I were doing this, that would</p> <p>14 somehow make the mistakes in AdX</p> <p>15 column but would leave the</p> <p>16 remaining three correct, or the</p> <p>17 other way around, I can't -- I</p> <p>18 cannot imagine what that would</p> <p>19 be.</p> <p>20 You know, it's -- it's the</p> <p>21 same code. It's doing what you</p> <p>22 tell it to do, and it's doing it</p>	<p>1 MS. RHEE: Let's mark for</p> <p>2 this deposition Exhibit 4, which</p> <p>3 is your opening report.</p> <p>4 THE WITNESS: All right.</p> <p>5 I have a copy of it, so --</p> <p>6 BY MS. RHEE:</p> <p>7 Q. Well, I'm going to give it</p> <p>8 to you.</p> <p>9 A. All right.</p> <p>10 Q. Because we have to have a</p> <p>11 marked copy.</p> <p>12 A. No problem.</p> <p>13 (Document marked for</p> <p>14 identification as Bjedov</p> <p>15 Exhibit 4.)</p> <p>16 BY MS. RHEE:</p> <p>17 Q. All right. So I'm going to</p> <p>18 direct your attention to Page 47,</p> <p>19 Paragraph 116.</p> <p>20 And you can keep me honest.</p> <p>21 These are your words in your report.</p> <p>22 "Google distinguishes</p>
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<p>1 on all four of these, you know,</p> <p>2 at the same time.</p> <p>3 BY MS. RHEE:</p> <p>4 Q. Okay.</p> <p>5 A. But I do want to say, he is</p> <p>6 the expert. I look at his credentials.</p> <p>7 And I go, like, this is a very low-level</p> <p>8 task. It would be impossible for an</p> <p>9 expert of his caliber to make -- you</p> <p>10 know, to make a mistake in that</p> <p>11 particular field.</p> <p>12 Q. Okay. You can put that</p> <p>13 aside.</p> <p>14 In your opening report, you</p> <p>15 conclude that Google's operational</p> <p>16 separation for DFP and AdX -- I'm sorry.</p> <p>17 You talk about how AdX and</p> <p>18 DFP already have operational separation.</p> <p>19 Do you recall that?</p> <p>20 A. Yes, I do.</p> <p>21 Q. Okay. I'm going to</p> <p>22 actually --</p>	<p>1 between 'AdX Serving' and 'DFP Serving,'</p> <p>2 which reflects operational separation in</p> <p>3 service deployment and management."</p> <p>4 Yes?</p> <p>5 A. Yes.</p> <p>6 Q. Okay. From your report?</p> <p>7 A. Mm-hmm.</p> <p>8 Q. And those are your words?</p> <p>9 A. Yes.</p> <p>10 Q. You wrote those?</p> <p>11 A. My team and I worked</p> <p>12 together, but I proofread and approved</p> <p>13 every word in the -- in the whole</p> <p>14 report.</p> <p>15 Q. Okay. So even if they</p> <p>16 aren't your words, you approved of them?</p> <p>17 A. No, no, no. The words are</p> <p>18 mine with the exception of articles,</p> <p>19 which you have probably noticed all of</p> <p>20 those were more or less added by</p> <p>21 somebody else who English-proofread the</p> <p>22 paper.</p>

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<p>1 form.</p> <p>2 BY MS. RHEE:</p> <p>3 Q. You -- you didn't look at,</p> <p>4 for example, internal Google documents</p> <p>5 at that time. Okay.</p> <p>6 COURT REPORTER: You have</p> <p>7 to answer out loud. Sorry.</p> <p>8 THE WITNESS: No, I</p> <p>9 didn't.</p> <p>10 BY MS. RHEE:</p> <p>11 Q. Okay. Just based on your</p> <p>12 answer, I want to understand, in your</p> <p>13 thinking about dependencies --</p> <p>14 A. Mm-hmm.</p> <p>15 Q. -- in your first stage of</p> <p>16 coming up with your expectation about</p> <p>17 the number of dependencies there would</p> <p>18 be and how long it would take to replace</p> <p>19 them.</p> <p>20 A. Mm-hmm.</p> <p>21 Q. Did you look at and/or rely</p> <p>22 on Professor Weissman in your Stage I</p>	<p>1 Exchange.</p> <p>2 And so I have a reasonable</p> <p>3 starting point to say, I know</p> <p>4 how many dependencies I should</p> <p>5 be dealing with here.</p> <p>6 And I make my own</p> <p>7 estimates around that, and I do</p> <p>8 my work related to that.</p> <p>9 BY MS. RHEE:</p> <p>10 Q. And you did all of that</p> <p>11 without looking at or relying on</p> <p>12 Professor Weissman or any of his work?</p> <p>13 A. That is correct.</p> <p>14 Q. I see. Okay.</p> <p>15 And then I take it from</p> <p>16 your answer, when you got to the point</p> <p>17 where you looked at Professor Weissman's</p> <p>18 opinion and his work, it confirmed for</p> <p>19 you your initial assessment and your</p> <p>20 expectation.</p> <p>21 Is that -- have I got that</p> <p>22 right?</p>
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<p>1 process?</p> <p>2 A. No.</p> <p>3 MR. TESLICKO: Object to</p> <p>4 form.</p> <p>5 BY MS. RHEE:</p> <p>6 Q. Okay. That's very helpful.</p> <p>7 I see.</p> <p>8 So your reliance on</p> <p>9 Professor Weissman is in your, as I</p> <p>10 think you put it, pressure testing, or</p> <p>11 testing of your Stage I opinion?</p> <p>12 MR. TESLICKO: Object to</p> <p>13 form.</p> <p>14 THE WITNESS: I would say</p> <p>15 it is during the step where you</p> <p>16 refine your opinion.</p> <p>17 Again, AdX is an Ad</p> <p>18 Exchange.</p> <p>19 I have actually,</p> <p>20 firsthand, worked on complete</p> <p>21 migration, partially write and</p> <p>22 just a whole mess of an Ad</p>	<p>1 A. That is fair to say. We</p> <p>2 were roughly talking about, let's say,</p> <p>3 the same -- certainly, the same order of</p> <p>4 magnitude.</p> <p>5 Q. I see.</p> <p>6 Okay. But you didn't need</p> <p>7 him or rely on him to get to your</p> <p>8 original estimates?</p> <p>9 A. No.</p> <p>10 MR. TESLICKO: Object to</p> <p>11 form.</p> <p>12 BY MS. RHEE:</p> <p>13 Q. Okay. And you got to your</p> <p>14 original estimates -- I just want to</p> <p>15 understand -- again, based on your own</p> <p>16 experience?</p> <p>17 A. My personal experience with</p> <p>18 migrating a similar-type product or --</p> <p>19 you can even call it the same, but</p> <p>20 probably not the same.</p> <p>21 Q. Okay. Which product is</p> <p>22 that?</p>

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<p>1 A. That's the Facebook's ad</p> <p>2 exchange that, if you will see, in 2011,</p> <p>3 Facebook got to the point that the</p> <p>4 existing ad exchange product, indexers</p> <p>5 and finders, were no longer performing</p> <p>6 for the needs of the company.</p> <p>7 And so we had a complete</p> <p>8 redesign and migration that had to be</p> <p>9 done in parallel, in order to be able to</p> <p>10 continue growing the ad revenue for the</p> <p>11 company.</p> <p>12 And I was the only</p> <p>13 performance and capacity engineer</p> <p>14 involved in that whole product.</p> <p>15 Q. Okay. And so that's the</p> <p>16 experience that you relied upon in</p> <p>17 making your original estimates?</p> <p>18 MR. TESLICKO: Object to</p> <p>19 form.</p> <p>20 THE WITNESS: That is the</p> <p>21 experience I called on. One of</p> <p>22 the things that I've done in the</p>	<p>1 that AdX and DFP will be migrated first</p> <p>2 to the Google public cloud?</p> <p>3 A. I am proposing what I would</p> <p>4 call one reasonable option, but I'm not</p> <p>5 saying that other people could not come</p> <p>6 up with other reasonable options that,</p> <p>7 you know, go to different destination</p> <p>8 and so on.</p> <p>9 Just one reasonable option,</p> <p>10 and in my option, I propose going to</p> <p>11 Google public cloud, yes.</p> <p>12 Q. Okay. And that option that</p> <p>13 you put forth --</p> <p>14 A. Mm-hmm.</p> <p>15 Q. -- which is that AdX and</p> <p>16 DFP first get migrated to the Google</p> <p>17 public cloud, that impacts your</p> <p>18 estimated timelines that you put forth</p> <p>19 for all of the downstream steps, right?</p> <p>20 MR. TESLICKO: Object to</p> <p>21 form.</p> <p>22 THE WITNESS: Yes and a</p>
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<p>1 past but certainly not, you</p> <p>2 know, the only.</p> <p>3 It's -- I would say it's</p> <p>4 the closest. But there are, you</p> <p>5 know, other things that you get</p> <p>6 involved with that you can</p> <p>7 reasonably say they may not be</p> <p>8 ad exchange but they will</p> <p>9 require the same dependencies.</p> <p>10 BY MS. RHEE:</p> <p>11 Q. Okay.</p> <p>12 MS. RHEE: Why don't we</p> <p>13 take a quick break.</p> <p>14 MR. TESLICKO: Great.</p> <p>15 THE VIDEOGRAPHER: Off the</p> <p>16 record at 2:18.</p> <p>17 (Short break.)</p> <p>18 THE VIDEOGRAPHER: On the</p> <p>19 record at 2:32.</p> <p>20 BY MS. RHEE:</p> <p>21 Q. Okay. New topic.</p> <p>22 Your migration plan assumes</p>	<p>1 no.</p> <p>2 The reason why I suggest</p> <p>3 you should go -- you should</p> <p>4 consider going to Google public</p> <p>5 cloud is because I have</p> <p>6 guarantee that I will have</p> <p>7 expertise available on Google</p> <p>8 public cloud and, obviously, on</p> <p>9 Google public -- private cloud</p> <p>10 available to me at the time of</p> <p>11 divestiture.</p> <p>12 If, for example, let's say</p> <p>13 Amazon were to decide and be a</p> <p>14 buyer -- and this is me just</p> <p>15 picking a person out of thin</p> <p>16 air. I have no idea if they are</p> <p>17 in any way, shape, or form,</p> <p>18 one -- but they are the owners</p> <p>19 of their own cloud, right. So</p> <p>20 they are the owners of AWS and</p> <p>21 S3.</p> <p>22 And so if a potential</p>

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<p>1 And --</p> <p>2 BY MS. RHEE:</p> <p>3 Q. You mean a software</p> <p>4 engineer?</p> <p>5 A. Software engineer from the</p> <p>6 product team, yes.</p> <p>7 And you should be able to</p> <p>8 get this done in a couple of days.</p> <p>9 Q. Okay. I just want to --</p> <p>10 A. Mm-hmm.</p> <p>11 Q. Thank you for the</p> <p>12 clarification.</p> <p>13 A. No problem.</p> <p>14 Q. I am not an engineer, so I</p> <p>15 now want to just clarify.</p> <p>16 Your testimony today is</p> <p>17 that you believe you really just need</p> <p>18 one performance engineer, one site</p> <p>19 reliability engineer, and one software</p> <p>20 engineer from the product team working</p> <p>21 over a couple of days?</p> <p>22 A. Yeah. To get this done.</p>	<p>1 MR. TESLICKO: Object to</p> <p>2 form.</p> <p>3 THE WITNESS: No. What --</p> <p>4 what you're doing in that stage</p> <p>5 is -- so you have found the</p> <p>6 systems that you are relying on</p> <p>7 and you need to replace.</p> <p>8 Not only are you picking a</p> <p>9 system that you will be</p> <p>10 eventually replacing it with,</p> <p>11 but you actually are doing the</p> <p>12 cuts.</p> <p>13 You are -- in the first</p> <p>14 stage -- and how I would suggest</p> <p>15 that they do this -- is</p> <p>16 basically write a simple</p> <p>17 passthrough calls, and so you --</p> <p>18 you kind of add a layer. You</p> <p>19 can call it a mock, if you like.</p> <p>20 And in the first stage</p> <p>21 that thing does nothing but</p> <p>22 passes through the call that</p>
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<p>1 Q. Okay. And this is the</p> <p>2 first stage of your migration plan that</p> <p>3 you labeled "Deployment Analysis"?</p> <p>4 A. "Deployment Analysis," yes.</p> <p>5 Q. Okay. All right.</p> <p>6 And the second stage of</p> <p>7 your --</p> <p>8 A. Mm-hmm.</p> <p>9 Q. -- four-stage migration</p> <p>10 plan you call "Technical Decoupling,"</p> <p>11 correct?</p> <p>12 A. Correct.</p> <p>13 Q. Okay. And that's the stage</p> <p>14 of your migration plan that you believe</p> <p>15 will take the most amount of time,</p> <p>16 correct?</p> <p>17 A. That is correct, yes.</p> <p>18 Q. Okay. And that stage is</p> <p>19 evaluating the replacements for all of</p> <p>20 the dependencies for AdX and DFP and</p> <p>21 then choosing the best replacement</p> <p>22 options?</p>	<p>1 will then go to whatever is</p> <p>2 still currently the system</p> <p>3 supporting AdX in a Google</p> <p>4 private cloud.</p> <p>5 Once you have identified</p> <p>6 all of those, let's say, for</p> <p>7 database, because that is the</p> <p>8 one that I believe should start</p> <p>9 first, the -- the first thing</p> <p>10 that I would do is verify did we</p> <p>11 really identify all of those</p> <p>12 correctly.</p> <p>13 And now because all of the</p> <p>14 calls are going through the</p> <p>15 mock, that is relatively easy to</p> <p>16 do.</p> <p>17 I sort of disable the</p> <p>18 mock, and if the database is</p> <p>19 still getting calls from me,</p> <p>20 that means that there are places</p> <p>21 that I've missed them, and I</p> <p>22 have to go and find them as well</p>

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<p>1 and redirect them to go to my</p> <p>2 mock implementation of the call,</p> <p>3 which is doing nothing but doing</p> <p>4 the passthrough.</p> <p>5 At this point in time, I</p> <p>6 have all of the database calls</p> <p>7 listed in one place and</p> <p>8 available to me.</p> <p>9 And, hopefully, by this</p> <p>10 point in time, we have decided</p> <p>11 to -- as to what is going to be</p> <p>12 our replacement.</p> <p>13 But let's say we haven't.</p> <p>14 This would be a great place and</p> <p>15 opportunity to say, you know,</p> <p>16 let's -- let's speak to</p> <p>17 different replacement</p> <p>18 candidates. And we have all of</p> <p>19 this code in front of us. Let's</p> <p>20 just write substitute APIs for</p> <p>21 two different databases, if</p> <p>22 that's what we are choosing.</p>	<p>1 making my time estimates is, honestly,</p> <p>2 how would I feel if somebody told me, do</p> <p>3 this in this amount of time. And if I</p> <p>4 would feel like, ooh, that's -- that's</p> <p>5 tight. It's possible but tight.</p> <p>6 That is not going to be the</p> <p>7 estimate I'm going to give, because I</p> <p>8 don't think -- I don't think that's fair</p> <p>9 to the engineers who are tasked with the</p> <p>10 job.</p> <p>11 And so the way I come up</p> <p>12 with something like eight months is, of</p> <p>13 all the systems that we have talked</p> <p>14 about, F1 is going to be the most</p> <p>15 complex replacement, in my opinion.</p> <p>16 I would be surprised if I'm</p> <p>17 wrong about that.</p> <p>18 You know, if there are some</p> <p>19 other databases that they are calling,</p> <p>20 they will be really small compared to</p> <p>21 the -- to the F1 stuff.</p> <p>22 And so I look at it, and I</p>
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<p>1 But this is also a place</p> <p>2 that, if you have a buyer</p> <p>3 already identified, you can get</p> <p>4 their input on what is the</p> <p>5 replacement system they would</p> <p>6 like.</p> <p>7 And, fundamentally, you</p> <p>8 just have to rewrite those APIs.</p> <p>9 BY MS. RHEE:</p> <p>10 Q. Okay. And sitting here</p> <p>11 today --</p> <p>12 A. Or API calls.</p> <p>13 Q. Sitting here today, what is</p> <p>14 your opinion about how long this step or</p> <p>15 stage in the -- your four-step migration</p> <p>16 plan, it would take?</p> <p>17 A. So I have given that stage</p> <p>18 eight months, and I -- when I make these</p> <p>19 kinds of determinations, in general --</p> <p>20 I've been called a pessimist, so just so</p> <p>21 you know.</p> <p>22 But the way I look at</p>	<p>1 say, given the size that I have been</p> <p>2 told about the system, how much time</p> <p>3 would it take to migrate a database of</p> <p>4 that size into the new environment.</p> <p>5 And luckily, I know exactly</p> <p>6 how long that's going to take, because</p> <p>7 I've done that, let's see, 2011, 2012,</p> <p>8 2013, 2014, 2015, skip '16, '17 and '18.</p> <p>9 So I've done it seven times in my life.</p> <p>10 And so I know -- and,</p> <p>11 actually, it's a bigger database than</p> <p>12 what we are talking here. And --</p> <p>13 Q. For each one of those</p> <p>14 years, you've migrated a bigger database</p> <p>15 than what we are talking about here?</p> <p>16 A. Yes. At the time of this</p> <p>17 stuff. I migrated -- each one of those</p> <p>18 years that I gave you, Facebook opened a</p> <p>19 brand-new data center region, and when</p> <p>20 you are opening a brand-new data center</p> <p>21 region, you have to migrate the whole</p> <p>22 database.</p>

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<p>1 And Facebook, I'm assuming</p> <p>2 even today, has the largest MySQL</p> <p>3 database in the world. And it certainly</p> <p>4 had it during those years. And I had to</p> <p>5 make sure that that migration happened,</p> <p>6 and that when I said it was done, it</p> <p>7 actually was up and running, and the</p> <p>8 rest of the data center could come</p> <p>9 online.</p> <p>10 Q. Okay. So I just want to</p> <p>11 make sure I understand.</p> <p>12 A. Mm-hmm.</p> <p>13 Q. In each of those years, the</p> <p>14 example that you're given --</p> <p>15 A. Mm-hmm.</p> <p>16 Q. -- giving as the basis for</p> <p>17 your opinion is, at Facebook, in each of</p> <p>18 those years, there was a new data center</p> <p>19 that came online?</p> <p>20 MR. TESLICKO: Object to</p> <p>21 form.</p> <p>22 THE WITNESS: A new data</p>	<p>1 A. Both.</p> <p>2 Q. Okay.</p> <p>3 A. I mean, that's -- so you're</p> <p>4 building -- you're building a new data</p> <p>5 center.</p> <p>6 You are doing new power.</p> <p>7 You're doing new networking.</p> <p>8 Q. I -- I --</p> <p>9 A. Bringing the machines.</p> <p>10 Everything is new. All of the hardware</p> <p>11 is new.</p> <p>12 And then once you have the</p> <p>13 hardware and the hardware has been</p> <p>14 energized, now you can start moving the</p> <p>15 different parts of the system.</p> <p>16 And database is the first</p> <p>17 part that you start with because it</p> <p>18 takes the longest. And so --</p> <p>19 Q. I just want to make sure I</p> <p>20 understand.</p> <p>21 A. No problem.</p> <p>22 Q. Yes, you are moving</p>
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<p>1 center region. There were many</p> <p>2 data centers coming online. But</p> <p>3 in those years, a whole new</p> <p>4 region was coming online, and,</p> <p>5 therefore, you had to migrate.</p> <p>6 When just the data center</p> <p>7 comes online, you don't</p> <p>8 necessarily migrate the</p> <p>9 database, because just when --</p> <p>10 but when the whole new region, a</p> <p>11 new space that you weren't in</p> <p>12 before, then you actually have</p> <p>13 to move the database into that</p> <p>14 space.</p> <p>15 BY MS. RHEE:</p> <p>16 Q. Okay. And when you're</p> <p>17 using these examples of new regional</p> <p>18 data centers coming online --</p> <p>19 A. Mm-hmm.</p> <p>20 Q. -- are you talking about a</p> <p>21 software migration or a hardware</p> <p>22 migration?</p>	<p>1 software, because you're moving data?</p> <p>2 A. Mm-hmm.</p> <p>3 Q. But are you making any</p> <p>4 changes to the software that you are</p> <p>5 moving?</p> <p>6 MR. TESLICKO: Object to</p> <p>7 form.</p> <p>8 THE WITNESS: When you</p> <p>9 say -- so -- so you're making a</p> <p>10 lot of changes to the</p> <p>11 configuration files that we have</p> <p>12 been talking about earlier.</p> <p>13 But you are not changing</p> <p>14 the database itself.</p> <p>15 BY MS. RHEE:</p> <p>16 Q. Okay. That's what I wanted</p> <p>17 to understand.</p> <p>18 A. Yeah. No problem.</p> <p>19 Q. And -- okay. So that's</p> <p>20 Stage II of your migration plan.</p> <p>21 A. Mm-hmm.</p> <p>22 Q. You think it will take no</p>

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<p>1 very early stages of rolling out</p> <p>2 a bespoke replacement for</p> <p>3 Memcached called TAO. That was</p> <p>4 really a breakthrough cache for</p> <p>5 social network-type</p> <p>6 applications.</p> <p>7 And so Instagram is using</p> <p>8 Memcached, and -- and basically</p> <p>9 comes into Facebook</p> <p>10 infrastructure. And I remember</p> <p>11 us provisioning them with</p> <p>12 servers to run Memcached.</p> <p>13 But they immediately also</p> <p>14 decide that they wanted to</p> <p>15 switch to TAO. And one of the</p> <p>16 instructions that we had was to</p> <p>17 basically enable Instagram to be</p> <p>18 successful and to be happy, and</p> <p>19 we really wanted them to just</p> <p>20 feel welcome at Facebook.</p> <p>21 And so they were what's</p> <p>22 called "speed line." And so</p>	<p>1 form.</p> <p>2 BY MS. RHEE:</p> <p>3 Q. Oh, you did?</p> <p>4 A. Oh, yeah. I mean, pretty</p> <p>5 much if it happened at Facebook between,</p> <p>6 let's say, 2011 and 2015, and it</p> <p>7 involved servers and hardware and the</p> <p>8 data centers, I was --</p> <p>9 Q. You were involved?</p> <p>10 A. Yeah. I was giving those</p> <p>11 servers out. They had to come through</p> <p>12 me.</p> <p>13 Q. Okay. So -- so it was in</p> <p>14 that capacity you were involved in the</p> <p>15 Facebook AdTech stack improvement or</p> <p>16 upgrade?</p> <p>17 A. So in both of these cases,</p> <p>18 and I'm -- honestly, I haven't verified,</p> <p>19 but lead PE for integration was a</p> <p>20 gentleman called Chris Bray.</p> <p>21 And so, you know, I worked</p> <p>22 very closely with him during that time</p>
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<p>1 they start swapping to TAO.</p> <p>2 I don't, as an infra</p> <p>3 engineer, consider that a part</p> <p>4 of migration. To me, that is a</p> <p>5 part of product upgrade.</p> <p>6 And, yes, it does add some</p> <p>7 time to the whole thing. But I</p> <p>8 would consider that systems</p> <p>9 replacement made by the choice</p> <p>10 of the product team that were</p> <p>11 not necessary for the migration</p> <p>12 to be completed, but that they</p> <p>13 added time to the migration</p> <p>14 itself.</p> <p>15 BY MS. RHEE:</p> <p>16 Q. Okay. You talk about</p> <p>17 specific Facebook examples that you</p> <p>18 participated in, because the Instagram</p> <p>19 example, I take it, you did not</p> <p>20 participate in?</p> <p>21 A. Oh, I --</p> <p>22 MR. TESLICKO: Object to</p>	<p>1 to make sure that the whole thing</p> <p>2 happens.</p> <p>3 Q. I just want to understand.</p> <p>4 What do you mean by "lead PE"?</p> <p>5 A. So, you know, on something</p> <p>6 like migration, like Instagram</p> <p>7 migration, you will have multiple</p> <p>8 production engineers. They are the</p> <p>9 equivalent of Google SREs. And you're</p> <p>10 not going to have just one. You will</p> <p>11 have multiple ones working on it.</p> <p>12 And Chris was, from my</p> <p>13 perspective, the main lead, let's call</p> <p>14 it SRE, to state it in the terminology,</p> <p>15 for Instagrations. And he is the person</p> <p>16 that I work with during -- you know,</p> <p>17 during that time. I spent probably half</p> <p>18 of my work time working with him on just</p> <p>19 making sure that what he needs, he gets.</p> <p>20 Q. Okay. So it was in</p> <p>21 Instagrations, you were making sure</p> <p>22 Chris --</p>

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<p>1 A. Mm-hmm.</p> <p>2 Q. -- got what he needed?</p> <p>3 A. Correct. To make</p> <p>4 Instagrartion happen.</p> <p>5 Q. Okay. So the things he</p> <p>6 might need are things like servers?</p> <p>7 A. Oh, absolutely. Servers.</p> <p>8 But also -- you'd be surprised, but --</p> <p>9 because you were going to transition to</p> <p>10 ads. And ads is in particular about</p> <p>11 this.</p> <p>12 With ads, it isn't just</p> <p>13 give me a thousand servers. Ads can be</p> <p>14 incredibly picky about, I want a</p> <p>15 thousand servers right here. And "right</p> <p>16 here" could be a place where all of my</p> <p>17 servers are gone and are doing other</p> <p>18 things.</p> <p>19 It could be, you know, a</p> <p>20 data center that has been around for a</p> <p>21 while. It could be a place that I'm</p> <p>22 actually planning on completely</p>	<p>1 different story.</p> <p>2 Q. Okay. Okay.</p> <p>3 A. But yeah.</p> <p>4 Q. A thousand servers in</p> <p>5 Norway?</p> <p>6 A. You're very close. Sweden.</p> <p>7 Q. Okay. Okay.</p> <p>8 A. They're really close.</p> <p>9 Q. Okay.</p> <p>10 A. But, yeah, you know, if --</p> <p>11 if -- so for Facebook, which is slightly</p> <p>12 different, obviously, than Google, but</p> <p>13 the structure is you have what we have</p> <p>14 called News Feed, which is the middle</p> <p>15 thing, why people come to Facebook. Or</p> <p>16 they used to. Now it's the ads feed,</p> <p>17 you know.</p> <p>18 And so you give the</p> <p>19 machines to that. That is my Number 1</p> <p>20 priority.</p> <p>21 Second priority is ads,</p> <p>22 because we have to pay the bills for all</p>
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<p>1 decommissioning.</p> <p>2 And it is still my job to</p> <p>3 give ads whatever they ask for because,</p> <p>4 frankly, they pay my salary. So I --</p> <p>5 I'm -- have a pretty good incentive to</p> <p>6 make sure that they continue doing what</p> <p>7 they are doing.</p> <p>8 Q. Okay. So in the AdTech</p> <p>9 stack migration, it was a similar role,</p> <p>10 where whoever was the lead production</p> <p>11 engineer --</p> <p>12 A. Yes. In that case, yeah,</p> <p>13 different person.</p> <p>14 Q. Okay. Who was that?</p> <p>15 A. Jack Pan-Chen, JPC.</p> <p>16 Q. It was to give JPC what he</p> <p>17 specifically needed, for example,</p> <p>18 however many servers in the middle of</p> <p>19 Europe?</p> <p>20 A. You know, you wouldn't go</p> <p>21 to middle of Europe. You would want to</p> <p>22 go north, where it's cold, but it's a</p>	<p>1 of this stuff.</p> <p>2 And then after that, all</p> <p>3 the other projects come and go, and, you</p> <p>4 know, you have Instagram come in and</p> <p>5 suddenly Instagram becomes this, like,</p> <p>6 wow, you're really valuable property.</p> <p>7 And, you know, they start climbing up</p> <p>8 the stack. And I want Instagram to be</p> <p>9 roughly on the same level as the Big</p> <p>10 Blue. But you do have this priority.</p> <p>11 At Google, that priority is</p> <p>12 search. You take the Search away,</p> <p>13 the -- you know, people are not just</p> <p>14 going to come to see ads. You have to</p> <p>15 put Search above everything else. And</p> <p>16 then you put ads.</p> <p>17 And now you're looking at</p> <p>18 maybe Gmail as another, you know, viable</p> <p>19 thing that you have to watch out for.</p> <p>20 You know, at Facebook there</p> <p>21 are other products. They also make some</p> <p>22 money and so on. But you have to take</p>